DEPARTMENT OF DEFENSE

HEARINGS

BEFORE THE

SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS
HOUSE OF REPRESENTATIVES

EIGHTY-FIFTH CONGRESS

FIRST SESSION

SUBCOMMITTEE ON DEPARTMENT OF DEFENSE APPROPRIATIONS

GEORGE H. MAHON, Texas, *Chairman*

HARRY R. SHEPPARD, California
ROBERT L. F. SIKES, Florida
W. F. NORRELL, Arkansas
JAMIE L. WHITTEN, Mississippi
GEORGE W. ANDREWS, Alabama
JOHN J. RILEY, South Carolina
DANIEL J. FLOOD, Pennsylvania
RICHARD B. WIGGLESWORTH, Massachusetts
ERRETT P. SCRIVNER, Kansas
GERALD R. FORD, JR., Michigan
EDWARD T. MILLER, Maryland
HAROLD C. OSTERTAG, New York

SAMUEL W. CROSBY, *Staff Assistant to the Subcommittee*

THE BALLISTIC MISSILE PROGRAM

(Hearings Conducted on November 20 and 21, 1957)

Printed for the use of the Committee on Appropriations

UNITED STATES
GOVERNMENT PRINTING OFFICE
23795 WASHINGTON : 1958

COMMITTEE ON APPROPRIATIONS

CLARENCE CANNON, Missouri, *Chairman*

GEORGE H. MAHON, Texas
HARRY R. SHEPPARD, California
ALBERT THOMAS, Texas
MICHAEL J. KIRWAN, Ohio
W. F. NORRELL, Arkansas
JAMIE L. WHITTEN, Mississippi
GEORGE W. ANDREWS, Alabama
JOHN J. ROONEY, New York
J. VAUGHAN GARY, Virginia
JOHN E. FOGARTY, Rhode Island
ROBERT L. F. SIKES, Florida
PRINCE H. PRESTON, Georgia
OTTO E. PASSMAN, Louisiana
LOUIS C. RABAUT, Michigan
SIDNEY R. YATES, Illinois
FRED MARSHALL, Minnesota
JOHN J. RILEY, South Carolina
ALFRED D. SIEMINSKI, New Jersey
JOE L. EVINS, Tennessee
JOHN F. SHELLEY, California
EDWARD P. BOLAND, Massachusetts
DON MAGNUSON, Washington
WILLIAM H. NATCHER, Kentucky
DANIEL J. FLOOD, Pennsylvania
WINFIELD K. DENTON, Indiana
TOM STEED, Oklahoma
HUGH Q. ALEXANDER, North Carolina
CHARLES A. BOYLE, Illinois

JOHN TABER, New York
RICHARD B. WIGGLESWORTH, Massachusetts
BEN F. JENSEN, Iowa
H. CARL ANDERSEN, Minnesota
WALT HORAN, Washington
GORDON CANFIELD, New Jersey
IVOR D. FENTON, Pennsylvania
ERRETT P. SCRIVNER, Kansas
FREDERIC R. COUDERT, JR., New York
CLIFF CLEVENGER, Ohio
EARL WILSON, Indiana
BENJAMIN F. JAMES, Pennsylvania
GERALD R. FORD, JR., Michigan
EDWARD T. MILLER, Maryland
CHARLES W. VURSELL, Illinois
HAROLD C. OSTERTAG, New York
FRANK T. BOW, Ohio
HAMER H. BUDGE, Idaho
CHARLES RAPER JONAS, North Carolina
MELVIN R. LAIRD, Wisconsin

KENNETH SPRANKLE, *Clerk and Staff Director*

APRIL 21, 1958.

To Members of the House Appropriations Committee:

In making a survey of the ballistic missile program last fall, the Subcommittee on Department of Defense Appropriations visited various headquarters and missile installations throughout the country. The survey took members to the many missile facilities on the west coast, to the Ballistic Missile Agency at Huntsville, Ala., and to the testing site at Cape Canaveral, Fla. It included numerous briefings at these various points. As a part of this survey, the subcommittee held 2 days of hearings in Washington, D. C., on November 20 and 21, 1957. A number of top officials of the Department of Defense testified at these hearings. The releasable portions of that testimony is contained in this volume.

The proceedings of these hearings were not printed earlier because so much of the testimony was classified for security reasons. Since last November, enough of the information given has been declassified to make it now worthwhile to print the hearings for future use of the committee.

GEORGE MAHON,

Chairman, Subcommittee on Department of Defense Appropriations.

DEPARTMENT OF DEFENSE

THE BALLISTIC MISSILE PROGRAM

WEDNESDAY, NOVEMBER 20, 1957.

WITNESSES

HON. NEIL H. McELROY, SECRETARY OF DEFENSE
HON. DONALD E. QUARLES, DEPUTY SECRETARY OF DEFENSE
HON. WILFRED J. McNEIL, ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
WILLIAM HOLADAY, DIRECTOR OF GUIDED MISSILES
ALVIN G. WAGGONER, EXECUTIVE ASSISTANT TO THE DIRECTOR OF GUIDED MISSILES
COL. ROBERT E. COFFIN, OFFICE CHIEF, R. & D. (GUIDED MISSILES), ARMY
COL. JOHN R. DEANE, OFFICE CHIEF, R. & D. (GUIDED MISSILES), ARMY
REAR ADM. J. E. CLARK, DIRECTOR OF GUIDED MISSILES DIVISION, OFFICE CHIEF, NAVAL OPERATIONS
BRIG. GEN. C. M. McCORKLE, ASSISTANT CHIEF OF STAFF, GUIDED MISSILES, HEADQUARTERS, USAF
COL. R. J. NUNZIATO, OFFICE, DEPUTY CHIEF OF STAFF, DEVELOPMENT, SPECIAL PROJECTS, USAF

Mr. MAHON. The committee will come to order.

The spectacular developments of recent weeks have captured the attention and imagination of the people of the Nation and the world. All of our people are interested. Many of them are puzzled. Some, if not all, are concerned, and some are alarmed, as you well know, Mr. Secretary.

Mr. McElroy, you are Secretary of Defense in perhaps the most critical moment in several decades. You are confronted with the making of very grave decisions.

We carry on a constant study of defense programs in connection with our responsibility as members of the Appropriations Committee. A number of weeks ago members of the committee began to contact me and say, "We need to get going to see what goes on; we need to have a first-hand look." Some felt we ought to have a meeting immediately in Washington with you, Mr. Secretary, and others; some felt we ought to go to the field and we have more or less compromised. We have gone to the field where we have studied the ballistic missile program, particularly on the west coast, where much of the most vital part of the work is being done, as you know, except for the very important work being done at Huntsville and the firing that takes place in Florida.

We propose to go further into the field and visit the plants and laboratories and the military and civilian people in Government.

As you probably know, later this week we expect to be at the Army Ballistic Missile Agency, and then as soon as we can we will go to Cape Canaveral.

By the way, I hope, as one of the early tests of your leadership as Secretary of Defense, you will see to it that—if I may say this with a twinkle in my eye—we get a firsthand opportunity to view the successful launching of an IRBM and a ICBM on Monday and Tuesday of next week, and probably with a satellite thrown in.

We have not met here for a lot of faultfinding and complaining. We would certainly not be complaining at the new Secretary. You have not been in office long enough for us to have any reason to complain. Besides that, everything that I have heard about you has been very favorable. I am told you are a man of decision, and I think that is a wonderful attribute.

We just hope you can get the facts and that your decisions will be wise.

Now, we would like to know, Mr. Secretary, a number of things. Of course, our main hearings will be next year. We will have months of hearings. We realize we find you at a most critical moment as far as the budget is concerned. Usually budget decisions are made in December and not at this time. We are sorry about that. As you know, this meeting was set up more than a month ago.

Secretary McElroy. Yes. We are very glad to be here, Mr. Chairman.

Mr. Mahon. The first thing we would like to do is to have you undertake to help us evaluate the threat to our national security in the light of recent developments.

You were quoted in the newspapers 2 or 3 days ago as saying that obviously the Soviets are ahead of us in the ballistic missile and satellite programs. That seems to be the overwhelming weight of opinion that we get from civilian and military sources, though there have been a very few voices in the minority, to the effect we are abreast in the missile field.

Nobody, with the satellites of the Soviets orbiting, can claim we are ahead at the moment in the satellite field.

Mr. Wigglesworth. I notice that ex-Secretary Wilson was quoted the other day as saying that nobody in the world knew whether Russia was ahead, behind, or what the situation was—it was all more or less guesswork.

Mr. Mahon. Well, that is one of the things we want to explore. Those are some of the things that we will want to explore here today.

I understand that the Soviet Union has fired ballistic missiles ranging from 25 miles to 2,500 or 3,500 miles. I understand that several of them have been IRBM's—within that general range—and some of them have been ICBM's.

HEARING PROCEDURES

Now, I would like to say that this hearing will be made available to the Department of Defense and to the committee. I do not know whether it will or will not be printed. Certainly it will not be printed soon as far as I know. If it is printed, it must be sanitized. If it is not printed, you will have a copy and we will have a copy. We do not want to be hampered by security problems. In fact, I do not

DEPOSITED BY THE
UNITED STATES OF AMERICA

know of anything that is supposed to be secure any more. About everything has already been printed.

Will you give us, Mr. Secretary, an evaluation of just what the threat is and what the change has been since we last met in this room for consideration of the defense budget?

Secretary McElroy. Mr. Chairman, if I may, I would like to read a short statement. Before I do that I would like to make plain to you how we would like to make ourselves most freely available to the members of the committee.

You well know—and you probably know these gentlemen better than I—Mr. Quarles is Deputy Secretary of Defense, and he is very familiar with this program. He will answer particularly any questions that are raised which have to do with intelligence in this area. I have also with me Assistant Secretary of Defense, Mr. McNeil, who, as you well know, is the Comptroller of the Department of Defense.

Mr. Mahon. And the dean of the Pentagon.

Secretary McElroy. The dean of the Pentagon; that is correct.

Mr. Mahon. And a very, very able man.

Secretary McElroy. I am very proud of him.

We also have the Director of Missiles of the Department of Defense, Mr. Holaday, so we think we are qualified within our capacities as individuals to give you the answers that are to be generated out of the Pentagon.

I would like to tell you this is my initial appearance before a committee, and I think as far as I have been able to find out, this is a very good way for me to learn what the committee system of Congress is like. I have appeared before one other committee but it was a committee that was considering whether I should be confirmed in this office or whether I should not. I think that was more preliminary than current business. This will be my introduction to this process of government and I am very much interested in being a part of it.

I would like, before I read this statement, to advert to the quotation that you referred to because I think it requires a bit of correction.

The question that was asked had to do—at least as I heard the question phrased—with the combination of missiles and satellites, and that is the reason I said it is quite evident to me on the satellite program the Soviets are ahead of us. I would not say it is anything like as obvious that the Soviets are ahead of us in the field of missiles. While I think it would be wise for us to conduct ourselves in accelerating the program in this country on the assumption they have some edge on us, I think it is, as I say, not at all positive from the intelligence we have, that they are substantially, or even at all ahead of us in the deployable missiles.

Mr. Mahon. If I may interrupt, Mr. Secretary, it seems to me that is one of the decisions you are going to have to make. If we are abreast, why all the concern? If we are behind, then that is a different situation. The people out in the field seem to indicate that there is no doubt in their minds but that in the ballistic missile field we are behind. If we are not, that is one of the things we want to learn right now.

Secretary McElroy. We will have a good deal more to say about that. I will say as far as my conduct of my part of this job is concerned, I feel as if I must proceed on the assumption we have some catching up to do.

PRINTING OF RECORD

Mr. SHEPPARD. Just a minute. For my benefit, I am wondering whether or not we can determine at this moment if this record is to be made a public record. I think perhaps under the circumstances and the fact that this is the first appearance of the Secretary it might be to the advantage of all concerned that the record just be for the benefit of the committee exclusively.

Mr. MAHON. I think we can make that decision. I think that we ought to proceed with the view that it will probably be printed, but it will certainly be sanitized so that there will be nothing in it that is objectionable to the witnesses who appear before us.

Mr. SIKES. May I supplement what Mr. Sheppard has said. I think that everything that can be printed about this program already has been printed as a result of the hearings of other committees. I think if there are facts that we can have which would be helpful to us on an off-the-record basis, or a closed record basis, it would be advantageous for us to proceed on the assumption that it would not be a printed record; otherwise, we will be getting more or less what other committees have gotten and released, which presumably the committee members have read.

Mr. MAHON. I do not know of any other committees that have held hearings.

Mr. SIKES. Senator Russell's committee has held hearings and the Government Operations Committee are holding hearings now.

Mr. MAHON. And you think that we should not print the record?

Mr. SHEPPARD. I say that we should not.

Mr. SIKES. I think we can get more information if we have a closed record.

Mr. MAHON. We can make that decision in executive session.

Secretary MCELROY. Suppose that I read my statement. It may answer some of the questions. It is not long.

STATEMENT OF HON. NEIL MCELROY, SECRETARY OF DEFENSE

Mr. Chairman and members of the committee:

We are glad to have the opportunity to meet with you today to discuss our guided missile program. I know that you have a great deal of background in the guided missile field and that you have recently visited a number of our major guided missile establishments. I also understand that you plan to visit other installations in the near future.

We should use the term "guided missile program" very carefully because, as you are well aware, it encompasses many separate weapons system developments that can do a variety of tasks. Since you are familiar with these missile systems, I am sure you are not interested in having me go over them in detail with you at this time. Mr. Quarles, Mr. McNeil, and Mr. Holaday will, of course, be glad to answer any questions that you may have.

Several of these systems are fully operational and have been for some time. This means that the military services have successfully accomplished one of the most difficult aspects of new weapon system in that they have trained the necessary officers and men to use these new weapons, and they have also solved many of the problems of maintenance and logistic support.

The next step for some of these systems is obviously to replace them with more advanced weapons. We are having considerable success in the testing program of these second generation of guided missile systems.

EXPENDITURES ON MISSILE PROGRAMS

We are currently spending on these programs at the rate of approximately $3 billion per year. The fiscal year 1959 rate of expenditures are estimated to be even higher. The importance of guided missiles to the effectiveness of our military services is beyond any question, and our rate of expenditure only partially measures our interest in these weapons.

SOVIET MISSILE PROGRESS

Our intelligence sources give the Russians credit for having fired missiles in the long-range category. Since our own development team has not successfully fired an intercontinental ballistic missile, it is apparent that the Russian development effort in this area may be enjoying more success than is our own program. We are certainly pouring a tremendous effort into the ICBM development and have very competent development teams engaged in these programs.

CUTBACK IN ICBM PRODUCTION

In August the Defense Department informed you of a cutback in the number of missiles being fabricated for the Atlas and Titan test programs from the number that had previously been planned. This seems to have been a sound decision based on the best technical advice obtainable at that time. It has been stated by those in charge of that development effort that the readjustment of numbers in the Atlas test program will not be the deciding factor with respect to the time by which we can successfully demonstrate an ICBM operational capability. That progress will be paced by technological factors. I have recently received recommendations that we should take the gamble that is involved in an immediate decision to increase our ICBM production capability even before test results have fully justified this step. The final decision in this matter has not as yet been made, but I feel sure that there will be some acceleration of this production effort. Aside from a rather frantic "crash" program of somewhat doubtful effectiveness for the long pull, there appears to be little that we can do to make a significant change in the date by which we will achieve the first operational ICBM.

I can assure you that we will make a maximum effort in this area consistent with good management practice.

IRBM PROGRAMS

The situation appears to be more favorable when we look at the IRBM. At the time of the August hearing, the Department of Defense was studying the relative merits of the Thor and Jupiter as well as the possibility of obtaining from the combined Thor and Jupiter development programs a single missile that would combine the best elements of each. That matter was thoroughly studied in great detail by Mr. Holaday, General Schriever and General Medaris,

Mr. Holaday as Chairman. The Department of Defense came to the conclusion that any interchange of major system components would undoubtedly delay the attainment of the earliest operational capability. Since neither of these missiles had flown a fully guided flight or had tested a full-scale nose cone at the time that the decision was made, it was decided that we needed additional test flights in order to be sure we retained the missile program that would give us the earliest possible operational capability. This is the present situation with respect to the Thor and Jupiter programs. Both are being carried forward so that either system will be capable of meeting the operational date which has been used in the past. I anticipate that a decision as to which missile will be produced in quantity will be made within a few months.

We always retain the option of deciding to proceed with both, but we did not make this decision at this time.

OVERSEAS DEPLOYMENT OF IRBM

In the meantime, recognizing that an IRBM is every bit as effective as an ICBM if it can be placed on United States or allied bases within range of targets, we are exploring the possibility of deployments in places in Europe other than the United Kingdom.

I would say that need not be limited to Europe in our thinking.

POSSIBILE ACCELERATION OF IRBM PROGRAM

I have under study now a recent recommendation that we accelerate the production of IRBM missiles and the necessary supporting ground equipment to achieve an earlier operational date than the date which we have been using in our discussions. There are a great many factors to be considered in such a study including our capacity to train the military personnel that would be required as well as the problem of base negotiations with our NATO allies. I regret that we do not have all of these answers at this time, but I can assure you that we are going to do everything we can to get these intermediate-range missiles on bases in Western Europe at the earliest practicable date.

POLARIS PROGRAM

We are also studying the possibility of acceleration of the Navy Polaris program. This is also a very complex program because of the associated requirements for submarine design and construction as well as a considerable improvement in navigation equipment and techniques that will be required. You will remember that the time scale of the Polaris development was very carefully worked out to take full advantage of concurrent improvements in the several areas of technology involved. We wanted to take advantage of a step forward in the development of warheads, and the time scale of that development has been related to propulsion and guidance developments in the guided missile art, to establish our overall development schedule for the Polaris. There is some danger that too rapid an acceleration of this system might throw this very carefully planned time scale into some confusion. If we can, in fact, accelerate the availability of a reasonable submarine operational capability without throwing the program out of balance, we intend to do so.

It looks as if we can.

Mr. MAHON. You just stated you thought that we could accelerate the Polaris program?

Secretary MCELROY. Yes.

I interpolated that at the conclusion of the paragraph.

Mr. MAHON. Some of us looked at it in the California area and we were very much impressed with the possibilities.

Secretary MCELROY. We are too. I thought I should point out that there are a number of things that have to happen concurrently and the more rapid pacing involves more rapid pacing in component areas. That is the reason for the statement as expressed here.

SATELLITE PROGRAM

We recognize that the Russians have embarked on a very considerable satellite effort. We have had such a program in the study and combined development stage for some time. The program which now faces us is to determine how much more effort we feel is appropriate in this area. At the present time, I can only assure you that we have under study many proposals in this general field.

SPACE AND SATELLITE AGENCY

We plan to establish in the Department of Defense a special agency to handle our satellite and space research and development projects. Tentatively we are thinking of calling this—and this has not been announced—the Special Projects Agency of the Department of Defense. We plan to assign to this agency all of our effort in the satellite and space research field. In addition, it appears that we might wish to have this agency direct and manage the Department of Defense progrem in the antiballistic missile field. Other projects and programs may also be assigned from time to time. What we have in mind for that agency is that the vast weapon systems of the future in our judgment need to be the responsibility of a separate part of the Defense Department that has a responsibility that is inescapable in order to follow these various will-of-the-wisps—if they are originally in that kind of state—and carry them through to a point where there can at least be a determination of their feasibility and what their probable cost might be. So we are thinking of this Special Projects Agency as having a function that extends beyond the immediate foreseeable weapons systems of the current or near future.

1959 BUDGET PREPARATION

I know that your committee appreciates that none of our programs can be accelerated without our cutting back other programs or providing additional funds. We will probably have to do both. We are working very hard on the preparation of our 1959 budget and any possible modification of the 1958 program that may be required, and would hope to have these matters finalized within the next several weeks. Another presentation on this subject is planned before the National Security Council on Friday and it is too early to give you exact figures in regard to our budget. We will be glad, however, to answer any of your questions in this general area to the extent that we can at this time.

That concludes my statement.

Mr. MAHON. Mr. Secretary, I want you to call freely upon others in your organization to comment on any of these questions.

Secretary MCELROY. Thank you.

Mr. MAHON. We realize you can comment in a general way on practically any question we raise, but we want the most definite responses we can possibly get, and no doubt Mr. Quarles and Mr. McNeil can be quite helpful, and also Mr. Holaday.

Secretary MCELROY. I think that they will give most of the answers.

Mr. MAHON. That would be satisfactory.

1959 BUDGET LEVEL

Now, as to the budget itself, Mr. McNeil, I believe the amount of the budget is never communicated to the Congress until the President submits it?

Mr. MCNEIL. That is correct.

Mr. MAHON. It would not be proper for us to ask you what you think will be in the budget? I do note that the morning paper says that you said yesterday that probably the spending budget for defense would be in the area of $38 billion or $40 billion.

Mr. MCELROY. I did not read that. That question was asked of me yesterday—whether I thought that would be a reasonable expectation—and I just said that perhaps someplace in there would be a reasonable expectation.

Mr. MAHON. That does not indicate that the Department of Defense is embarking on a big spending spree, so to speak, in the defense area?

Secretary MCELROY. It can mean pretty heavy spending relative to the past in certain areas.

Mr. MAHON. I hope it does because, while I do not want to mount a charger and ride off in all directions, I do believe we must accelerate and accentuate certain highly vital programs, and I assume that is embraced in your planning?

Secretary MCELROY. It is. Whether it is exactly in the proportions you would say, I think that will have to be determined. It is substantial and it is within our best judgment of what is obtainable and what seems to be needed.

Mr. MAHON. Yes.

Have you pretty well made up your own mind in the Department of Defense what you want to do in regard to the situation?

Secretary MCELROY. Oh, yes.

Mr. MAHON. Moneywise and otherwise?

Secretary MCELROY. Yes; we have had to do that in preparing the budget, and our budget preparation——

Mr. MAHON. Has been substantially completed?

Secretary MCELROY. Yes. On Friday it should be pretty nearly wrapped up except for some "sweeping around."

Mr. MAHON. I would like to comment briefly on the Polaris program. I think we will all agree it has great possibilities and certainly we are interested in your pursuing that very carefully. No doubt you are doing that.

SOVIET LEAD IN SATELLITE PROGRAM

Now, I would like to comment on the satellite program. Obviously we are behind in the Geophysical Year in satellite effort, and I know we would be behind in the program of military satellites.

Mr. SCRIVNER. On what do you base that last statement—that you know we are behind in military satellites?

Mr. MAHON. I would simply say that they at least have a satellite revolving around the earth. That is one of the essential things for a military satellite. I yield to anyone else who has a different opinion.

Mr. SCRIVNER. Perhaps one of the best things that could happen would be that somebody would get it perfectly clear in their mind that this International Geophysical Year satellite that we have been talking about is a civilian scientific undertaking and does not relate to our military satellite program. Secretary Quarles will verify that, and I think he has tried to make that statement clear.

ASSIGNMENT OF SATELLITE PROGRAM TO NAVY

Mr. MAHON. I would like briefly to discuss with you, Secretary McElroy, and Secretary Quarles, this problem of our satellite program. Naturally, Mr. Quarles is closer to the picture.

It has been reported that when a satellite program was first considered three services were requested to make proposals and that the proposals of the Army and the Air Force were rejected for various reasons and the proposal of the Navy was adopted. Is that correct?

Mr. QUARLES. That is correct; yes. I think in proper time it would be well for me to amplify that answer, but that is a correct statement.

Mr. MAHON. Let me proceed a moment and you can speak in detail.

Now, apparently both the Air Force and the Army were far ahead of the Navy in the development of rocket powerplants at that time so it appears at present that perhaps the assignment of the satellite program to the Navy was not based on the capability of getting the job done in the time required. Why was this done? Was it for the purpose of pacifying the Navy in the interservice competition for roles and missions?

Mr. QUARLES. A short answer to that is: No, but again I think it would be wise to amplify the answer.

Mr. MAHON. I was looking over a magazine last night. Everybody has mounted his charger and is riding off in all directions as far as the newspapers and magazines are concerned. I think that you will agree to that.

Mr. QUARLES. The answer to that is "Yes."

Mr. MAHON. Now, I would like to quote this excerpt from one of the magazines of our day:

> Donald A. Quarles, now Deputy Secretary of Defense and then Assistant Secretary in charge of research, made the decision to sidetrack the Army's earth satellite program in favor of a separate program to be run by scientists, with the Navy in charge of rocket launching . The White House did not interfere with this decision—a decision which led to delay.

Now, our principal interests here today is in the ballistic missile program. Of course, we are interested in satellites to the degree to

which they involved our security, and satellites do involve our security. I am sure everybody at the table will agree.

I think some statement in response to these questions which I have raised are very much in order at this time, Mr. Quarles, and I wish that you would speak to that as long as you like.

Mr. QUARLES. Thank you, Mr. Chairman. I certainly appreciate the chance to do it.

First, I would like to give you a word about the background on which we approached this matter at that time because it is very important to understand that.

(Discussion off the record.)

Mr. QUARLES. It seemed to us if we could establish a scientific satellite program which would in effect establish the principle that such a device is not offensive in character, that it travels in outer space in a way that is not a threat to the country overflown, that it would be a very valuable basis for proceeding with our satellite work. So the justification—and I will make this personal—the justification in my own mind at that time for a scientific satellite program, using defense resources, was exactly that motive of establishing the principles that seemed to me to be essential.

Now, obviously, had this been a military satellite, the chance of our establishing that principle would be less than if it were one that were associated with science and the International Geophysical Year, and it just happened that in a meeting in Rome in October of 1954 there was a discussion of the program of the Geophysical Year and the possibility of an earth satellite for scientific purposes was first advanced at that time and was endorsed by the Russians attending that meeting which we thought was a pretty good basis for our establishing such programs.

We had representatives there and our scientists came back and recommended to the Department of Defense that our Government support a scientific satellite program as a part of the Geophysical Year program. This was worked up jointly between our scientific community and the Defense Department as to plans, and of course there were several plans for the rocketry required to launch such satellites.

As the chairman has mentioned, or in quoting from the statement he read, all three departments made proposals as to how such a satellite might be launched.

The Air Force's proposal was based on its Atlas missile plan.

The Navy's proposal really had two aspects. The Navy was one partner in the so-called orbiter program which also involved the Army Redstone missiles and work and the Navy made an independent proposal which we now know as Vanguard and which involved rocket systems which at that time had no real military significance. This was a difficult problem. It involved, you might say, topside policy and how much to mix military things into it, and it also involved technical questions as to what kind of system might be most successful earliest in achieving the scientific objective. On the latter point we called together 9 or 10 of the top-flight scientists of the country to study the problem. They not only heard the proposals of all three of the departments, but they went out to appropriate places to make their own appraisal of the rocketry and other problems involved.

There was a difference of opinion in this advisory group. At one time they were more or less evenly divided as between the orbiter program, involving the Army Redstone rockets and certain Navy rockets in combination, and the Navy proposal that I now refer to as the Vanguard proposal which did not involve the Army rockets but did instead pick up a rocket that originally had been developed by the Army and later dropped and was available through General Electric Co. research and development in this field.

The committee, after studying this technically, and without any regard to service interests, recommended that the Navy program be adopted for technical reasons and on the basis that they believed it had technically the greatest chance of early success.

Mr. MAHON. This was not a "sop" to the Navy in any sense?

Mr. QUARLES. It was not in any sense, and the people who made the recommendation had not the remotest reason that I can see for having any interest in the Navy or the Army programs as such.

Now, I should make it clear their recommendation was directed toward a specific objective of mounting a satellite in orbit that would have a certain scientific characteristic; carry certain instrumentation and perform a certain mission of exploring the characteristics of outer space that scientists were then particularly interested in. It quite deliberately did not address itself to a large satellite that might be better adapted to the requirements of a military satellite, such as one for reconnaissance purposes.

RECOMMENDATION OF TECHNICAL COMMITTEE

This recommendation of the technical committee was made to me in my then capacity of Assistant Secretary of Defense for Research and Development and since it was a split decision, I referred it to what we call our Research and Development Policy Council, which was made up of senior representatives of all three of the military departments in the research and development area. They studied the matter carefully and recommended to me on a split basis, that we proceed with the Navy program.

Mr. MAHON. The Army felt the Jupiter had the best possibilities?

Mr. QUARLES. Not the Jupiter, sir, but the Redstone rocketry that was more or less available. It is what we came later to know as Jupiter-C but it was actually Redstone rather than Jupiter rockets.

On the basis of these recommendations, I recommended to the Secretary of Defense and the President that the Navy program be adopted, and it was adopted. As I say, these were in part technical considerations and in part political ones, but the program that was adopted was the recommendation of the best scientific talent we could get to study the matter at that time; not unanimous, but the large majority, and I am perfectly confident in my mind that it was made in complete good faith and represented the best scientific opinion of the day.

DEFECTS IN VANGUARD PROGRAM

It was later developed that the rocket systems in the Vanguard program were marginal to erect the kind of satellite that the scientists were anxious to have erected, so that we got ourselves into a little squeeze there by having the scientists push for more than was orig-

inally planned and the rocket people promised a little more than they were well able to deliver, so there were delays in the program, which I think the committee can easily imagine. Also, the program was specifically geared to the International Geophysical Year, and from the point of view of the scientists participating in the program, they were anxious to get their arrangements in place to observe this, and to benefit from it, before the launchings, so there was never any sense of time urgency because they were not quite ready for it at the beginning of the Geophysical Year themselves; I mean, the scientific people who would be observing it and getting the benefit of it.

INDICATIONS OF SOVIET SATELLITE PROGRAM

Now, as has been stated in the press, we did have rumors that the Russians were serious in this matter; there were rumors that they would attempt to launch a satellite earlier than our then schedules.

When we set up this program, the Navy expected that they would launch their first test satellite before ——— and we in fact worded it in such a way that test launchings could be made ahead of the Geophysical Year, just so nobody could accuse us of bad faith.

This, as I mentioned earlier, proved to be too optimistic.

The statement that we have never been in a race with the Russians in the scientific satellite field is an accurate statement, because, once we got geared to this international scientific community, and their instrumentation and observation and all the other things, we were on a program that seemed to us to be a sound, well-justified program, and while one can easily say that you overlooked the cold war impact of this thing, that is a hindsight kind of a judgment about it, and at any rate I have given you, I think, without any attempt to bias the situation, precisely the way the history developed.

Now finally I would just like to point out that the Russians, in going on their own and failing to coordinate their program with the International Geophysical Year, were guilty of some degree of bad faith in relation to their commitments to the scientific fraternity, and moreover, from the start they geared their program to their military rocketry and they ignored the scientific tie-in. They did make their programs scientific in nature, to a degree, but they did not attempt to internationalize the thing the way we had deliberately done.

(Discussion off the record.)

Mr. MAHON. In other words, there are some very encouraging aspects of this picture. I think you have presented them very well.

Mr. FLOOD. What would be one?

Mr. MAHON. Off the record.

Mr. FLOOD. Get by easily in the sense that nobody would be offended thereby?

Mr. MAHON. Yes.

Mr. FLOOD. Oh. How very nice.

SUCCESS OF VANGUARD PROGRAM

Mr. MAHON. I look with a great deal of fear at the Vanguard program. I do not believe it is going to click. I think it is going to fizzle. It may not. I hope it does not. Of course, that little ball flying

around in the heavens will be kind of a humiliating object when compared with the Russian satellites.

Mr. SCRIVNER. Why do you make that statement? Why will it be humiliating, when a study of it shows that it is going to have far more electronic and informational gadgets in it than the two Russian satellites?

Mr. MAHON. We can make that claim. That is anyone's opinion. I am just expressing my own.

Mr. SCRIVNER. You ought to make that a personal observation——

Mr. MAHON. It is personal.

Mr. SCRIVNER. So it will not carry the implication of a committee indictment.

Mr. MAHON. It is not a committee indictment. I am speaking only in my individual capacity. What you think is much more important than what I think as to whether or not this Vanguard satellite program will work, Mr. Quarles.

Mr. QUARLES. I believe, myself, it will be substantially on schedule and will do substantially what we have expected it all along to do, but no more, and what we have expected it to do I would not say will be humiliating, but will be perhaps disappointing to the country in many ways, in comparison with what the Russians will have done in the meantime.

Mr. MAHON. Yes; less spectacular.

Mr. QUARLES. Less spectacular, I agree. I would also like to pick up Mr. Scrivner's point, that scientifically it will be quite superior to anything they have yet done.

Mr. MAHON. Insofar as we know, but how do we know that?

Mr. QUARLES. I mean, Mr. Chairman, in respect to the two satellites they have launched.

SCIENTIFIC EQUIPMENT IN SOVIET SATELLITE

Mr. MAHON. How do we know what is inside the 2 satellites they have launched?

Mr. QUARLES. Well, they did reveal pretty much what their instrumentation in the first one was, and, of course, we recorded everything about it, including the signals back from it. We know what intelligence it sent back, and what intelligence it could not have sent back, and similarly in respect to the second one, in spite of its size and in spite of the dog test that was made and all, we know pretty well what it accomplished scientifically.

Mr. SIKES. What intelligence did it send back?

Mr. MAHON. What intelligence did it send back?

Mr. QUARLES. I will have to answer that question this way: If we take all that they told us, the first one sent back only information about its position in space, and, of course, that was valuable and we tracked it very successfully and gained a lot of information ourselves about things we wanted to know about the space in which it traveled.

There was always an argument as to whether the signal coming back was modulated by some intelligence which might, you see, have been gathered by the satellite and sent back as a special signal. There are ways of telling how much intelligence a signal could possibly carry, and the signal has been examined from this standpoint, and,

as a maximum, our scientists believe it may have sent back information about the ambient temperature through which it traveled, but it could not have sent back any more elaborate information than that.

Mr. MAHON. That is very interesting. I think it is fortunate we have a man in your position who has a background to interpret and evaluate these reports that you get from the scientists.

SECOND SOVIET SATELLITE

Mr. WIGGLESWORTH. May I ask a question, Mr. Chairman?

Mr. MAHON. Yes.

Mr. WIGGLESWORTH. Has it yet been determined as to the size or the weight of the second satellite?

Mr. QUARLES. We have no real way to make an independent check of that. We believe, from things that they said and things that we observed, that they were substantially correct in the information they gave about the size, weight, and content of the second satellite.

Mr. WIGGLESWORTH. When we were on the west coast a question was raised as to whether the weight applied merely to the satellite or everything that went with it. That, they thought, might be determined in the course of observation. It would make a very material difference in the accomplishment, of course.

Mr. QUARLES. You recall they announced the weight of their first satellite as around 175 or 180 pounds. We were never quite sure, and, in fact, the Russian testimony on the subject was somewhat contradictory. We were never quite sure whether they were adding the weight of the last-stage rocket to the weight of the satellite proper, or were not. Our scientists believed that they did, in fact, carry somehow a total weight, including batteries, that would be up in that order of 175 pounds.

This was an important question then, because it was, by implication, a measure of the power of the rockets that launched it. However, it ceased to be an important question when they launched one that surely weighed much more than that—a claimed weight of over a thousand pounds—and we are inclined to credit them with substantially that kind of weight.

Mr. WIGGLESWORTH. In terms of the satellite itself or of all that went with it?

Mr. QUARLES. There, again, there is some ambiguity because, when one of their scientists started drawing this thing to illustrate it, they drew, not a sphere that we would be calling a satellite, but an oblong thing that might have been also part of the last-stage rocket, so we really are without precise information on this point.

Mr. MAHON. Which is a very important point, is it not?

Mr. QUARLES. It is an important point. However, as I might bring out in the missile connection, we credit them with a rocket motor which, with appropriate follow-on stages, could launch a satellite into the orbit of Sputnik II at the weight they claim. So, again, we are inclined to accept their claims without any direct verification of it.

Mr. FLOOD. May I pursue this a minute, Mr. Chairman?

Mr. MAHON. Mr. Flood.

PSYCHOLOGICAL EFFECT OF SATELLITE LAUNCHINGS

Mr. FLOOD. Mr. Secretary, in view of the fact that you are confronted with a fait accompli by the Russians, are you suggesting that, merely because you are soon to launch a satellite which will be more sophisticated, as far as its intelligence potential is concerned, that simple fact, without more, balances this equation?

Mr. QUARLES. No; I am not, Mr. Flood, at all suggesting that.

Mr. FLOOD. Then what are you suggesting?

Mr. QUARLES. In fact, when you say "balances the equation" I think I would have to ask you to define what equation you are balancing.

Mr. FLOOD. I am glad you did. That permits me to ask this. You were very careful and very clear and chronological in your presentation of the satellite program, in reply to Mr. Mahon's question. You did that very carefully. You obviously had thought this out very carefully, to reply to that question, and you did it to a "T." Very well.

That mere fact startles me, because you are convinced, with all of your integrity, which is great, as a scientist and as an administrative statesman. You are convinced that you had no idea and you were considerably annoyed—this is a rhetorical "you"—over the hulla-baloo that was created after these fellows shot this thing.

Would you do things the same way all over again, as of this morning, if you had it to do all over again, in view of everything you have said—which you said carefully—and which justifies what you have done and who did it, under all of the circumstances? And there is no reason why you should not have known them. Would you have done it in precisely the same way, and for the same reasons?

Mr. QUARLES. Well, Mr. Flood, I would say that, if I had had throughout those years all the knowledge I have today, I might very well have made different recommendations than I made. However, that is one of these "iffy" questions, the answer to which really does not mean much, if I may say so, sir, because, had we done different things, they, too, might well have done different things, and this gets you into a long, "iffy" situation that is not very meaningful.

Mr. FLOOD. Let us not do that. Let us do this. This is a factual question now: During the years of which you speak, when this was being reexamined month by month——

Mr. SCRIVNER. What do you mean "when this was being reexamined?"

REASONS FOR NOT PLANNING TO LAUNCH UNITED STATES SATELLITE SOONER

Mr. FLOOD. Talking about the satellite sequence of events.

Did anybody at any time—did you, among others, if you did—seriously say at a meeting "Gentlemen, it is important for untold reasons that we shoot a satellite, if it is only as big as a grapefruit, now, and postpone the sophistication of it later, but we must now change our thinking from what we decided on when we instituted the program. The situation is developing in such a way that we should do something else first. We should take the Army rocket and fire this grapefruit tomorrow morning, while all the rest of this is going on, and would not be disturbed."

Mr. QUARLES. No, Mr. Flood, I never did make the statement you have suggested and there were two reasons for it.

No. 1, in the summer of 1955, I moved over to the Air Force job, and I was pretty well preoccupied with things there and the question you asked me did not relate to the Air Force. However, there was another very fundamental reason for not doing what you say, and I should have mentioned it earlier, namely that military departments that proposed to use military rocketry in their satellite plans, stated that in doing so we would have to accept delays in their military programs.

Mr. MAHON. In their ballistic programs, not their military satellite programs.

Mr. QUARLES. Their ballistic weapons programs, yes, thank you.

These delays, as we evaluated the whole thing as best we could, seemed unacceptable.

Now, it is true that, had we had a means in, let us say, June of 1957 to back up and do something different and quicker, one might very well at that time, and with what we knew about the timing of our program and the probable timing of theirs, one might very well at that time have made a different decision, but as of that time there was no alternative that appeared to offer a faster United States satellite in orbit than the one we were then working on.

Mr. FLOOD. Then I understand that our people evaluated fully, clearly, and deliberately the potential in the cold war, what might or might not result if the Russians fired the first, and after having resolved that, after having evaluated to our fullest capability, after realizing the shattering results which might happen if they did it, knowing they might do it and could do it, we set that aside and said, "As against that, knowing full well what it could be, we will do this." That is what happened; is it not?

Mr. QUARLES. Well, I would rather stand on my own record than to endorse that statement, Mr. Flood, because your statement has to be taken in a particular time context.

Mr. FLOOD. No. I cannot accept that.

Mr. QUARLES. As of June 1957 one did have, I agree, not convincing but fairly plausible information that they might launch one first. I want to make it clear that as of that time we did not have a freedom of choice. At the earlier time, the situation was very different and as of that time, No. 1, it seemed from the Navy proposal, and had the Navy been able to meet its proposal, it is still true, we would have been the first to launch any kind of a satellite.

Mr. SCRIVNER. Might I make an observation, Mr. Chairman?

AWARENESS OF PSYCHOLOGICAL IMPORTANCE OF LAUNCHING FIRST SATELLITE

Mr. MAHON. May I ask this: The point is, I assume, that you agree, and we all agree, that the Soviet scored a spectacular psychological victory, which has been very damaging to us from the standpoint of world prestige, by launching the first satellite. Whether we foresaw that to the fullest extent in advance, I do not know. It certainly was not my problem to do it, but it seems that somebody in the Government should have.

I wonder if the seriousness of the situation was as fully clear to you and others as it is now?

Mr. QUARLES. There I am afraid I have to be personal again, because what people are aware of is a personal thing.

Mr. MAHON. Surely.

Mr. QUARLES. I can say that in late 1954 and 1955, when the program was being formulated, there was awareness in Government circles that studied these matters that a satellite launching had great psychological importance, and in fact, this was a factor, certainly, in establishing the program.

Now it was also recognized that nobody could be sure that we would be the first. All we could be sure of is that we were more apt to be the first if we tried to get one up than if we did not try to get one up, and so we embarked on the program.

Mr. MAHON. Mr. Scrivner.

VANGUARD UNDER CIVILIAN DIRECTION

Mr. SCRIVNER. Mr. Secretary in view of the questions asked by Mr. Flood directed to you, I think in all fairness you should point out that even with those questions, that the real direction of the IGY satellite has been under our civilian scientists.

Mr. QUARLES. That is very correct, Mr. Scrivner. I should have mentioned that.

Mr. SCRIVNER. In other words, in your position as Secretary of Defense for R. and D. you came into it incidentally.

FUNDING OF VANGUARD

As a matter of fact, the military came in the back door actually. My recollection is that last spring was the first time the military had ever appeared before this Appropriations Committee making any requests for funds for the satellite program.

Mr. FLOOD. Why?

Mr. SCRIVNER. Because that is the first time they had been required to.

Mr. FLOOD. Why?

Mr. SCRIVNER. The National Science Foundation had made the original request before the Independent Offices Subcommittee.

Mr. FLOOD. I know that. You have stated the question.

Mr. SCRIVNER. They got some money from the President's emergency fund.

Mr. FLOOD. You have stated clearly the facts.

Mr. MAHON. The fact is, Mr. Scrivner, that the Navy panel chaired by Mr. Sheppard had heard requests for the Navy project.

Mr. SCRIVNER. I said this is the first time it came before the full subcommittee. What I am getting at is that the suggestion has been made with some great degree of alarm that the Secretary, Mr. Quarles, had not made any great demand for haste in getting a propaganda factor into the launching of a satellite. What I am leading up to is the fact that I have read practically all of our hearings on this since the first one came in in 1953 or 1954, and I have heard few, if any, and I do not recall any right now, Members of Congress that created any cry of urgency on this, either.

Mr. FLOOD. Oh, Mr. Scrivner.

Mr. SCRIVNER. I am talking about the hearings.

Mr. FLOOD. You mean the printed hearings. I agree with that. You are right. That is not what I am talking about and you know it.

Mr. SCRIVNER. Let me make one more observation. This is somewhat facetious and yet has some truth in it, too. That is, in view of the very large number of American specialists on satellites that have been developed in the last 6 or 7 weeks, I do not think that the Russian educational program has proved itself so superior in that regard. It is amazing. Not only dozens but perhaps hundreds and thousands of American satellite specialists have been developed within 2 months, some of whom we never heard of before.

Mr. FLOOD. There are two sides to that. I will not develop the other.

Mr. SCRIVNER. There are two sides to a pancake, too.

Mr. FLOOD. Surely.

Mr. SIKES. Let me ask this, Mr. Chairman.

Mr. MAHON. Mr. Sikes.

Mr. SCRIVNER. As a matter of fact, Mr. Chairman, there is a paperbacked book [indicating] that is an exceptional piece of work. I am not going to advertise this, but it is fantastic in what it sets out. It is amazing how much of it has just been repeated here this morning and in other hearings. It is amazing when you look here on page 6 and hear one of the things referred to out in California. Really, it is a good handbook for every member of this committee to read because it has a lot of explanation in it that this committee has never been thoroughly given before.

TEN-YEAR INTEREST OF UNITED STATES IN SATELLITES

Mr. MAHON. Is it not true that you have been working on satellites for 10 years or more, Mr. Quarles?

Mr. QUARLES. Yes. That, again, is a little bit hard to pinpoint as the beginning time.

Of course, there had been speculation about satellites for many, many years. When the German scientists came over here, after the war, or were brought over here after the war, many of them brought with them rather specific concepts of satellite systems that could be used and you know they have been propagandizing—I do not use the word with any invidious meaning, but they have been writing things about satellites for the last 10 or 15 years and our Air Force satellite project dates back to immediate postwar days. Mr. Forrestal, when he was Secretary of Defense, made references to it, so there is nothing new about this.

There is something rather specifically new about the concept of a scientific satellite and the Vanguard program had precisely the history I have attempted to outline.

EFFORT TO OVERCOME LAG IN VANGUARD PROGRAM

Mr. MAHON. Mr. Sikes wanted to ask a question.

Mr. SIKES. I recall at the time of our hearings early in the year that it was estimated there was a good possibility that we would fire the first test satellite.

Surely you people who were directing the program knew that the program was falling behind and you knew there was a possibility that the Russians were going to launch a satellite ahead of us with resulting serious results worldwide, from a prestige standpoint. Was there no effort made to accelerate our program in order to attempt to hold to the early launching date that was given to this committee?

Mr. QUARLES. I cannot answer that question, Mr. Sikes, because such an attempt would have been made by the Navy team working on it. I am not in position to answer. I would like to reserve that question for the Navy group responsible for the program, if I may.

Mr. SIKES. It is one that is important to this committee.

Mr. QUARLES. I do not mean to sidestep it.

Mr. MAHON. Would you see that we get that response?

Mr. SIKES. I have one additional question.

Mr. MAHON. Mr. Sikes may proceed.

PROPOSED LAUNCHING OF SATELLITE BY ARMY

Mr. SIKES. How realistic, may I ask, is the talk of a launching in January by the Army of a test missile?

Mr. QUARLES. I have not heard the Army use a date as early as January.

Mr. MAHON. They told us 90 days, Mr. Quarles.

Mr. QUARLES. That, I think, makes it February or March, to my best knowledge.

Mr. SIKES. I am quoting the radio comment. I did not hear the testimony here.

Mr. QUARLES. Our best knowledge today, I thing, would fairly estimate one of these small 6-inch test vehicles to be launched early next month, and both the Army and Navy will be launching the scientific satellite, 20-inch, 20-pound kind of affair, early next year. I have heard of the possibility of both Army and Navy launching in February, and I did read in the paper this morning that the first one might be launched in January, but I have no substantiation of that.

Mr. MAHON. Mr. Secretary, is it a firm determination that the Army will launch a satellite? They have been instructed to prepare to launch. Will they launch a satellite or undertake to do so? Is that a firm decision?

Mr. QUARLES. That is a firm decision, subject only to this: That if the Navy is ready earlier, and does in fact launch a satellite earlier that meets the requirements and if it appears that the Army program is at that time superfluous and that efforts might better be directed at other things, I think that is a decision that we reserve as a possibility, but everything is going forward at this moment on the assumption that they will launch a satellite.

Mr. MAHON. I appreciate your statement. You expressed every confidence in the Navy launching of the Vanguard satellite. I had thought that the Jupiter launching of a satellite was more or less a backup. You have more or less confirmed that.

Mr. QUARLES. In the sense, I think, sir, that if, as the whole thing unfolds, the Navy does in fact complete its program and satisfies the Geophysical Year requirements for a satellite, and if it then appears that the Army, for some reason that I do not expect, but if it then

appears the Army is not ready to do it, it is conceivable that that part of the program might be canceled out.

Mr. FORD. Mr. Chairman?

Mr. MAHON. Mr. Ford.

EFFECT OF ACCELERATION OF SATELLITE PROGRAM ON MILITARY MISSILE PROGRAMS

Mr. FORD. Earlier, Mr. Quarles, you indicated that an expediting of the satellite program might have an adverse impact on the military missile program. To what extent, timewise and otherwise, would that have taken place, if we had sought to expedite the satellite program?

Mr. QUARLES. This goes back to the time when the original decision was made, Mr. Ford, and one of the questions that was asked at that time of each department making a proposal was "What effect would the carrying out of your proposal have on your high priority missiles work?" In the case of the Air Force, there was a stated delay in the Atlas program, and moreover, an uncertainty as to just when Atlas rocketry could be expected to be available. That was dropped for that reason. In the case of the Orbiter program which involved Redstone and Jupiter type of rocketry the Army, as I remember, estimated a delay of three months in that program if they undertook the Orbiter program. I would like to be in a position to correct the number of months, but it was that kind of a delay, and that was one of the considerations in not adopting military rocketry for this program.

Mr. FORD. In hindsight, would you say that those estimates made then would be valid today?

Mr. QUARLES. Yes. I would say that they would be valid today. Specifically, the Air Force program would not have been ready with its very high thrust rocketry for this program in time; certainly not without diverting effort from our top priority work in this field. As to the Army work, I expect I should let them answer your question, but at any rate, it is my best judgment that had they gone into the satellite program they would have diverted attention from their military rockets to at least the degree predicted back when we made the decision.

ARMY INSTRUCTIONS ON SATELLITE FIRING

Mr. MAHON. Mr. Quarles, I am a little afraid that, in undertaking to be calm, cool and collected, and objective at this moment of some degree of crisis at least, and perhaps some degree of hysteria, that we are approaching these things with too much conservatism.

Now, some of us on the committee spent 2½ hours with the Army yesterday. It seems to me they ought to know whether they are going to fire a satellite or not. If the Navy fires one, so what? Let us fire two. That is not too many. We ought to fire hundreds of them eventually. It seems to me that in this business of decisions the Army ought to know today, at noon, whether they are going to fire this thing and go at it like they are going to fire it. If they are just going to play along and get ready in case the Navy fails, that is a different situation. It does not give them the incentive that it seems to me they ought to have.

Do you think there is any merit in what I have to say?

Mr. QUARLES. I think that probably I have created the wrong impression, rather than differing at all with what you have said, Mr. Chairman. The Army is under orders of proper authority to proceed with preparations for launching a satellite, and to assume that they will launch one. In military terms, I do not think there is anything more than you can tell a man than to proceed now down this course. It does not say that you will reach the end of it without being called back or that you will not be deflected in it, but this is a perfectly firm instruction to the Army, and in my best belief, they are proceeding under it in good faith, and on the plan of launching a satellite as soon as they are ready to do so.

Mr. FLOOD. But they do not think so. That is the difference. You are the Department of Defense. They are in the Army. The Army does not think so. Let me tell you something.

Mr. QUARLES. I think I know quite a little bit about what the Army thinks, and I am sorry to disagree with you about the Army.

Mr. FLOOD. Do you? Very well. That is where I came in. You and I have known each other a long time. It is the terrible cliché, the mailman and the dog. Everybody knows the dog won't bite except the dog, but the Army now, at all levels, at half-past 11, is not as conversant with the order as you have made very clear. They do not think that is the order. I do not blame them, in view of what has happened to the Army. If I were the Army, I would agree with them.

Mr. FORD. As of yesterday they said they had orders to proceed to make preparations to fire.

Mr. FLOOD. That is right.

Mr. FORD. I do not know what more you could tell them, except to say that at the last minute they will not fire.

Mr. FLOOD. You cannot tell them any more, Mr. Ford. You cannot tell them any more. You know what the atmosphere is. So do I. The atmosphere in the Army is that they are handcuffed. That is what I think. I do not blame them.

Mr. MAHON. Here is our situation, gentlemen. Off the record.

(Discussion off the record.)

SPECIAL PROJECTS AGENCY

Mr. OSTERTAG. The Special Projects Agency of the Department of Defense, which I understand according to your statement, Mr. Secretary, will have jurisdiction over the satellite.

If that is so, then will this agency be responsible rather than the Navy, the Army or the Air Force for this program?

Secretary MCELROY. Not for this program. This program will proceed as it is now organized.

Mr. MAHON. That is the long-range program.

Secretary MCELROY. The reconnaissance, military applications.

Mr. SIKES. In that connection there have been a number of people who have advocated a fourth service, the Guided Missile Service, and they have some good logic behind their arguments. Is this the beginning of a fourth service?

Secretary MCELROY. No. This is an agency which would organize the research and development activity on advanced weapons. It would be assumed that as of the time the development program would

reach a point where an operational weapon would be around the corner that that weapon would then for operation be assigned to one of the services. This agency would then withdraw from its activity in this particular area.

Mr. SIKES. I still do not understand how it would fit into your program. Is this another agency or is this a division of authority within existing agencies?

Secretary MCELROY. It would fit into the principal extent——

Mr. SIKES. Who will compose it, people now in the program or new people?

Secretary MCELROY. Some of each. The man that will head it is probably going to come in from the outside.

Mr. SIKES. To what extent will it take authority away from the three services presently operating?

Secretary MCELROY. It will take research and development authority in those weapons areas where it is not obvious from the beginning as to what service would have the responsibility for the operation of a given weapon.

Mr. SIKES. It does sound like a fourth service.

Secretary MCELROY. It is not.

NEED FOR UNIFICATION

Mr. MAHON. Mr. Secretary, if I may say, I applaud your effort to do something about this appalling situation in the Department of Defense. What I think you need is not a fourth service but more real unification. I think you have got to do some realining and readjusting within the services. I think probably you will need some legislation and now is the time to strike when the iron is hot. If you can make up your own mind what you want and convince the President to submit a real program of unification and cooperation it is going to be a wonderful thing for this country and is going to save us a lot of money. In know Mr. Foote or one of the other Assistant Secretaries, talked about how glorious competition is. I watched a few football games lately. It is my observation that the members on the team who coordinate and cooperate are the ones who make touchdowns. They want all kinds of competition against the enemy, the opposing team, but they need cooperation and integration and coordination among themselves and we do not have it in the Pentagon and everybody I know of knows it. I think here is the place to really make hay and just putting on another superstructure is just going to add another layer and will not get the job done.

Secretary MCELROY. My observation has been—and this is subjective, but it has been very seriously considered—that one of the major provocations of the kind of interservice rivalry which I think the public and doubtless others as well, as well-informed people as the gentlemen on this committee, are concerned about arises from the fact that there are certain types of weapons that come into the picture which do not have any obvious and specific connection with one or more of the services. It is at that point that you provoke the entrance of programs on the part of all of the services. This is the kind of thing which you might do anyway because often on a new kind of weapon if it is important enough as you look down the road, you should pro-

ceed on more than one avenue. That was done, as you may well recall, in development of the atomic bomb.

Mr. MAHON. But you had 1 Manhattan project, you had 1 man running it, you did not have any rivalry between the 3 methods used. You had complete cooperation and coordination of all people working together in the same laboratories, but what we have now is a violent opposition from various services, not when the weapon is ready for use among the services but when they begin development of it.

Secretary MCELROY. That is what I am talking about in the case of this Special Projects Agency. There we plan to centralize the research and development of a weapons system or group of weapons systems which do not have any obvious service connection in their inception. We plan to use this agency for the purpose of carrying those weapons through the research and development stage. That means quite far down the road, including testing.

We do not intend to do this in the case of missiles because we think the program is too far along and imposition of any additional agency on top of that program would actually deter operational capabilities.

We are expecting to do it in the case of antimissile missile. We are planning to do it in the case of the satellite and, as I indicated earlier, any further things of an upstream nature.

Mr. FLOOD. Before touching on Thor and Jupiter, I asked 2 groups of questions; I wanted to ask 1 more group. I would like to do that now.

OBJECTIVES OF SPECIAL PROJECTS AGENCY

Mr. MAHON. Pardon me. I want to be sure that you have fully told us your thinking on this business of interservice rivalry and competition.

Secretary MCELROY. The way you described the desirability of the way the Manhattan project proceeded is really basically the reason we are setting up this Special Projects Agency. We do not think of it and do not talk about it as a Manhattan project. There were things you could do in wartime to throw money into the Manhattan project that are quite different from the way this will be handled. We will be asking for this Agency for appropriations to be made to the Department of Defense for the purposes of this development work, and to a considerable extent therefore, it does go along the line you are suggesting as being desirable because we would expect to have on these major systems in all probability more than one avenue explored. But they would be explored, as you suggest, under one control, which would keep from having a pulling and tugging and would make a good deal more positive coordination of the 2, 3, or 4, or whatever may be determined to be the number of avenues determined by the very responsible scientists available on a full-time or advisory basis.

Mr. MAHON. In other words, a duplication of effort, as was true in the Manhattan project. When you have the same people working closely together with other people seeking in answer, there is nothing wrong with that kind of approach, of course.

Secretary MCELROY. We do not think so.

Mr. MAHON. The only point is they have to be headed up and be completely cooperative, be completely integrated and coordinated and they are not now.

Secretary McElroy. As a single program.

Mr. Mahon. As a single program.

Secretary McElroy. That is what we are talking about. I made some of the same visits you did, Mr. Chairman, before I was sworn in on this job one of the things that was perfectly apparent to me was exactly what you are saying, the multiplicity of programs, all of them pretty far down the line. This multiplicity of programs is going toward the same result without any common direction and coordination except in the way in which that might be achieved by the wise working together of the services and that is not quite good enough, I am afraid.

It was out of having had some of the same experience you have just had that we have worked toward this particular kind of operation I described.

ANTI-ICBM PROGRAM

Mr. Mahon. Would the anti-ICBM be in that project upstream program?

Secretary McElroy. Yes, sir.

Mr. Mahon. I read in the morning paper where the Chief of Staff of the Army, Gen. Maxwell Taylor, was urging a $6 billion 3-year program for the anti-ICBM. What is your pitch on that?

Secretary McElroy. Well, General Taylor called me just shortly before I left to come up here and I think General Taylor is a little concerned about the way that built up.

NEED TO DECREASE INTER SERVICE RIVALRY

Mr. Mahon. I never saw the services do worse in this area and they are making their releases worse, each one vying for headlines. If you read the stream of headlines the last 6 weeks, it is fantastic the way rivalry is getting out of hand at the Pentagon.

Secretary McElroy. I agree with you.

Mr. Sheppard. Now that you agree with him, what are you going to do about it?

Secretary McElroy. That I cannot tell you. This is a little early. The very agency that I am talking about is working toward, as I say, an attempt to remove what we believe to be one of the major sources of that kind of rivalry. You always have some and there are some helpful things about competition among the services; let us not kick it out completely. But as I tried to indicate, we think one of the main reasons you get into the really intense aspects of this, where it gets at its toughest, is where you have a weapons system under development which looks as if it does not have an obvious mission assignment.

That is the kind of thing we are going to pull into this Special Projects Agency for the research and development stage. Then we will make the decision about who is going to have the operational responsibility and there will not be, I hope will not be, this kind of problem at least to the degree to which it has developed in the past.

Mr. Mahon. I want to say I am deeply gratified and encouraged by some of your statements.

Mr. Scrivner. May I make one point off the record.

(Discussion off the record.)

NAME OF NEW AGENCY

Mr. SCRIVNER. In view of many of the matters coming before us I would suggest that it would be less confusing if this were not referred to as the Special Projects Agency and that the Defense Department find some other suitable and apt name or initials to refer to it, so that we will not have that confusion arising to which I have just referred off the record.

Secretary MCELROY. We would like to note that suggestion, and will work on it. It has not been announced, and we like the word "agency" because of its——

Mr. SCRIVNER. I have no objection to the word "agency."

Secretary MCELROY. It may be that the special—we can find a better word, I think. We are trying to make it broad enough in terminology so that the tent can cover additional projects as they come along and give evidence of some future important potential.

ANTI-ICBM PROGRAM

Mr. MAHON. Are you going to push as rapidly as possible on a semi-crash program on the anti-ICBM, Mr. Quarles?

Secretary QUARLES. We are going to push as rapidly as a full evaluation of the situation seems to justify. When you say possible, Mr. Chairman, I am not sure we use the word in the same sense but, at least, we are going to give the matter high urgency and are going to push for a solution of it. However, that does not necessarily say we are ready to start spending money in the multimillion-dollar area range until we are a little bit sure how to handle the problem.

Secretary MCELROY. There is another thing that should be said there. One of our problems is to judge the probable cost of such a program. These increasingly sophisticated and complicated programs of one sort or another, defensive and offensive, get into such very large numbers that the consideration of this as against other means of spending might indicate a greater or lesser speed of work on this and just the same kind of decision that we have to make all the time. We cannot buy as many of everything as we would like, and I think we would like not to give the impression that we are set to really shoot the moon.

NEED FOR DECISIONS RATHER THAN INCREASED SPENDING

Mr. MAHON. Mr. Secretary, you will find in government, I am sure, that, too often, the answer proposed to any question, be it international policy, agriculture, or military, is to appropriate a few extra million dollars and relax and say, "We have that licked now and have nothing more to worry about." Just a mere spending spree, I think you will agree, is not the answer to the problems that confront us. Here you have JUPITER versus THOR. It is easier to say both services developed the IRBM and both services should prepare to use them in combat. Maybe that is the way to do it, but I think you want to give very grave consideration to that problem.

Secretary MCELROY. We have already established the service that is operational for the IRBM.

Mr. MAHON. That is no longer an issue?

Secretary McElroy. That is unequivocal, and this is the Air Force.
Mr. Flood. Why is that?
Secretary McElroy. Because it was established.
Mr. Flood. An excellent reason.
Secretary McElroy. It was established by Mr. Wilson.
Mr. Flood. Then I am so sorry. That is the end of that, I am sure, Mr. Secretary. You will find increasingly that that does not have the same importance it had at an earlier time. That is not an answer. However, forget that.

ANTI-ICBM PROGRAM

You are doing exactly the same thing with the antimissile program that some of us think you were wrong in doing from the beginning with the missile program. Some of us are under the impression that your conduct of the missile program was an unfortunate error of judgment. Some of us think that, when the decision was made to divide this as a competition among the three services, some of us on the very first day at great length said, "That is wrong; do not do it that way; do it this way." We think that you were wrong.

Now we think that you are doing exactly the same thing for exactly the same reasons with the antimissile program. Is that true?
Secretary McElroy. If you are talking up to date——
Mr. Flood. Up to date.
Secretary McElroy. Up to date there has been participation in that program by two services.
Mr. Flood. Then up to date, at least, there has been competition between 2 rather than among 3 on the theory that competition is good for your soul. Have we finally come to the decision that that is an error of judgment, that is a mistake, that is not the best thing to do; we are going to do something else which we should have done in the first place? Is that not where we are this morning?
Secretary McElroy. I though I had explained, Mr. Flood, what we plan to do is to put any two or more avenues of approach to a solution to the problem of the antimissile missile under a single agency, which would be in the Department of Defense.
Mr. Flood. Then what an extremely interesting mind these people have. Then the mere creation of a new alphabetical arrangement, without more, will solve the problem. You have not answered it; you have stated the question again. You are still going to have 2 or 3 people doing this but, since it is going to be under 1 head, that is all right; it will not be under 2 heads. That is going to solve it? Is that the scientific conclusion? Is that not ridiculous?
Secretary McElroy. It may be in your judgment, Mr. Flood.
Mr. Flood. Yes; it is.
Secretary McElroy. Yes.
Mr. Flood. That is the end of that.
Mr. Mahon. Off the record.
(Discussion off the record.)

ACCELERATION OF THOR PRODUCTION

Mr. Mahon. Out in the Douglas plant they want to produce the Thor faster than they are now. They say they have the capability,

and I got the firm impression that the people in the field believe that you should produce these THORS faster, that you should get more bases ready here and overseas, or, rather, overseas, to use them, employ them. Do you get my point?

Secretary McElroy. Yes.

Mr. Mahon. Am I to understand you have made the decision to accelerate production of the THOR missile at this stage?

Secretary Quarles. That has been made and released.

Mr. Mahon. How many will they make a month now?

Secretary Quarles. That is a buildup, Mr. Chairman, and I cannot give you the numbers precisely, but the buildup is from the present level of about ——— a month to a level of ———.

(Discussion off the record.)

Mr. Mahon. In other words, you have told them to get going on production. Will they work overtime?

Secretary Quarles. They are free to work such overtime as is necessary in the opinion of the project people to achieve the results. There is no Defense limitation on their overtime.

Mr. Mahon. This would indicate that you think the Thor has sufficiently progressed to where we can take the gamble to go on a little faster in the fabrication and production of the actual missile.

Secretary Quarles. That is right, sir, but the same answers would have applied had you asked me about the Jupiter.

JUPITER PRODUCTION

Mr. Mahon. But you have never ordered the production of the JUPITER except as a test vehicle.

Secretary Quarles. We have asked the Army as of several weeks ago to proceed with JUPITER arrangements, looking toward the deployment of JUPITER.

Mr. Flood. What are they going to use for money in the Army on JUPITER?

Secretary Quarles. The Army has been funded with all the money they have needed to carry out the orders they have received.

Mr. Sikes. What would be the production schedule on JUPITER, Mr. Secretary?

Secretary Quarles. I cannot give you the production schedule on JUPITER because in terms of production, as I think the committee understands, the Army's arrangements for production of JUPITER are comparatively recent as to date and I cannot tell you.

Mr. Sikes. Would it be lower production than THOR?

Secretary Quarles. Ultimately not, but probably just because of the start it would probably be a later time when they were able to build up to it.

Mr. Sikes. What are the causative factors on that?

Secretary Quarles. Mr. Chairman, if I may, I will have to correct an answer I gave. We have prepared, and I thought we had issued, but we have not as of this time actually issued the instructions on THOR.

Mr. Mahon. You mean on THOR?

Secretary Quarles. On THOR, we have given the Army the instructions to proceed with the full missile system on JUPITER.

On JUPITER at the moment they are building ——— a month, which is still a development buildup.

Mr. MAHON. You have not gone into any production buildup on JUPITER?

Secretary QUARLES. Beyond that, that is correct.

STATUS OF THOR AND JUPITER

Mr. MAHON. Mr. Holaday, would you say in your words what we have done as to the THOR and JUPITER?

Mr. HOLADAY. Both of these are still under development. I think, as I explained to you in California, we have certain facilities. At the present time THOR is operating on ——— missiles per month and JUPITER is operating on ——— missiles per month. We are still in the research and development area. This gives us all the missiles that we can possibly carry forward in a research and development program.

We have under study the possibility of increasing the production of both of these. As I explained to you in California, we can do this by 2 or 3 different routes. One is to go more shifts per day, go up to 3 shifts per day, we can go to the extreme of 7 days a week. The other is to add more machinery and facilities and do it on a normal easy route. So we have always under study these two methods of accelerating production.

The point Mr. Quarles raised here is that we have several proposals from the Air Force on buildup in which we can start producing and putting over in a shed so many missiles. We have not issued those instructions yet because we are waiting on a few more facts out of the development program to make sure we have exactly the missile we want to build and put out in the shed for deployment.

Mr. MAHON. In other words, you are afraid at the moment to build for actual operational use the THOR missile so you are not permitting them to go ahead, as some of them would like to do, with getting them ready for the inventory or putting them in the shed.

Mr. HOLADAY. They get to be very difficult, to answer your particular question, that we are not quite ready. We are convinced that both of them can become operational. Just what time we freeze a design and start producing—we could start maybe producing certain phases of the missile. There may be other parts of it we would still like to hold onto and accelerate that later. This is the problem we are working out back and forth between the services and all the ground-support equipment problem we discussed with you.

Mr. MAHON. In other words, Douglas is going to continue to make fewer missiles than they have the capability of making for a time.

Mr. HOLADAY. That is right, for a time but it may be very shortly that we will accelerate.

Mr. MAHON. JUPITER will be in the same category.

Mr. HOLADAY. That is right.

Mr. MAHON. I find a feeling that if we are going to deploy these missiles overseas we cannot wait for 100 percent efficiency if we want to get them overseas at an early date. There may be some that were defective within certain limitations, might be better than none at all at an early date for having IRBM in Europe. What is your thinking there?

(Discussion off the record.)

Mr. HOLADAY. Our planning is now to cut this off at some particular point and start producing hardware. These will be good missiles. They will have good guidance systems in them and be quite accurate. This is our planning and thinking.

PRODUCTION FACILITIES FOR THOR AND JUPITER

As you realize, the THOR has considerably more manufacturing facilities back of it than JUPITER because they have that large production line out there now which will produce ——— missiles a month. All we have back of the JUPITER is ——— missiles per month or get it up to ——— by going on more shifts. We do have this imbalance in production.

Mr. MAHON. What are you doing with Chrysler in Detroit on the Jupiter?

Mr. HOLADAY. They have about as I recall a number of ——— and ——— engineers working full time at ABMA. In fact they took part in putting in manufacturing facilities at ABMA, Chrysler and ABMA worked together laying out those manufacturing facilities. Chrysler is now working diligently on the problem of how they could set up another production line in Chrysler Corp., using all of the necessary work that has to be done to figure out just what they would produce there, what might be produced at ABMA or some other contractor. We have men that have been on this now for about 6 months doing this kind of coordination work. There are no manufacturing facilities at Chrysler for the Jupiter missile.

PROBABLE USE OF BOTH THOR AND JUPITER

Mr. MAHON. Mr. Quarles, is it more or less indicated to you that if you continue to move generally as you are, you are probably going to authorize both JUPITER and THOR facilities to go into the production of the operational missile?

Secretary QUARLES. I would not be able to answer that. It is still certainly in my expectation and intention that we would not authorize both, but things have changed in the last few weeks with a larger concept now of total deployment. It is possible that authorizing both would come to look like a good solution. I want to leave the impression though that it is still the intent to authorize one.

Mr. MAHON. That is still the official intent.

Now you are giving us some of the information we met here to get. Is there anything further you need to tell us on the status of THOR and JUPITER?

Secretary QUARLES. I think maybe you will find, Mr. Chairman, that this has not satisfied the members of the committee. I would like to just suggest this, if I might. I personally, as you know, have to be away during lunch time and I do not know how long that might take. I wonder if we could go back to the intelligence matter and try to dispose of that to your satisfaction before I leave and Mr. Holaday would be here in the afternoon immediately as you care to resume to pick up the THOR-JUPITER matter in any further detail.

Mr. MAHON. You have told us what you propose doing with THOR and JUPITER. Undoubtedly within the next few weeks you may

make a decision which will decide whether you go forward with both or drop one or consolidate them or what. You do not know the answer yet, so you cannot give us the answer.

I have a series of questions on the THOR versus the JUPITER which I would like for us to discuss but that will take considerable time.

We can get an intelligence estimate. Who can present us an intelligence estimate?

Secretary McELROY. Mr. Quarles.

Secretary QUARLES. I was prepared to do that. I thought maybe you would like to have that.

INTELLIGENCE ESTIMATE

Mr. MAHON. Let us get the intelligence estimate from you at this time.

Secretary QUARLES. Mr. Chairman, if you like, I will address myself to the intelligence estimate on missiles.

Mr. MAHON. Ballistic missiles only?

Secretary QUARLES. With particular reference to ballistic missiles.

Mr. SCRIVNER. Mr. Chairman, in view of the statement you made awhile ago about the number of firings of ballistic missiles Russia made, may we have a distinct understanding? HONEST JOHN is a ballistic missile.

Could you give us a brief definition of what you are talking about when you talk about merely a ballistic missile, a guided ballistic missile and a guided missile which is not ballistic? If we can have a clear understanding of those things while we are discussing this, it will help us all tremendously.

Mr. MAHON. The Army threw on the screen yesterday the agreed intelligence estimate as to capability of Russia vis-a-vis the United States and it was very good. I think we might ask somebody to bring that over but give us now a word picture of that situation.

Mr. QUARLES. I will first deal with the area of ballistic missiles, and by ballistic missiles I mean rockets that follow roughly ballistic trajectories and that are guided to the extent of putting them on the right trajectory and cutting off their power at the right point so that they will achieve the proper range.

(Discussion off the record.)

TRAINING AND FACILITIES NEEDED TO MAKE MISSILES OPERATIONAL

Mr. MAHON. Here is something I want to get. It does not do any good to have in the shed, I believe Mr. Holaday was saying, a bunch of IRBM's and ICBM's. If you are seeking an operational capability of a significant nature, you have to start way back in advance, months and years in advance, and you have to train your people, as you well know better than I, you have to get your bases, you have to get your ground handling and support equipment.

I am worried lest we are not making these decisions in these other areas, which are less spectacular but which are just as important when it comes to the actual employment of the weapons. I would like some assurance and enlightenment in that field.

Mr. QUARLES. Mr. Chairman, the programs—both the THOR and the ATLAS—and let us just talk about those two for the moment—

were both laid out to be complete systems programs to visualize the whole problem; the problem of not only developing the missile but developing the ground equipment to go with it, setting up the training arrangements and facilities for it, and visualizing the deployment requirements for it.

I would say that we have proceeded in a sense of great urgency along all of those lines.

EFFECT OF SOVIET SATELLITE LAUNCHING ON UNITED STATES PLANNING

Mr. FLOOD. But since then the shooting of this sputnik by the Russians is of no particular scientific value. It has some academic interest. You have done nothing about the situation as of today merely because they fired it, have you? The firing of the sputnik, as far as the Department of Defense is concerned, has produced nothing that existed before; has changed your plans in no way, and you are operating according to plan?

Mr. QUARLES. I would say, Mr. Flood, just to answer that quite candidly, that the firing of the sputnik has convinced me we are apt to get support from the people of the United States for a stronger program than I thought I was going to get support for last spring.

Mr. FLOOD. That is interesting, and I am sure you are quite right, but the mere firing of the sputnik as such has in no way accelerated, affected materially, the Defense Department with reference to its satellite, or its missile programs?

Mr. QUARLES. I would say we have taken full account of the implications of the firing of the sputnik and that we have made moves which are in the nature of an acceleration of the program; moves that will involve greater expenditures and moves which we now have greater assurance will be covered by appropriations.

Mr. FLOOD. Do you propose to outline them to us?

Mr. QUARLES. We will when we present our budget.

Mr. FLOOD. Not until then?

1959 BUDGET

Mr. QUARLES. I think it would not be wise to anticipate the President's budget as the chairman brought out.

Mr. FLOOD. Mr. Chairman, I am advised by Mr. Quarles that until the President presents his budget whatever changes that have taken place, if any—material or otherwise—in the Department of Defense in their missile and satellite programs will not be disclosed to this committee, or to the public until such time as the President presents his budget.

Mr. MAHON. I think we can resolve this question. Of course, the President's budget is an unknown factor at this time as it has not been determined.

Mr. FLOOD. What difference does that make?

Mr. MAHON. He cannot tell us what is going to be in the budget because he does not know.

Mr. FLOOD. These other people know.

Mr. MAHON. They do not know because these things are never finalized very far in advance.

Mr. FLOOD. Should they not be?

Mr. SCRIVNER. They never have been.

Mr. MAHON. I do not think that we will embarrass the Executive in his relationship with members of the Cabinet as to what is going to be in the budget. We have been told that the budget is going to be in the neighborhood of $38 billion or $40 billion.

Mr. FLOOD. We sat here the first week in August and there were before us the three departments of the armed services on this missile and satellite program. We spent 4 days, morning and afternoon in the first week of August and had a complete review up to the minute of the entire satellite and missile program in detail, from the secretarial level on down. We now come back the first week in November because of this Russian business. I want to know now, Do they have anything further to tell us than they told us on the first of August as the result of the Russian action? If not, what in the world am I doing here?

Mr. MAHON. What is your comment?

Mr. QUARLES. There are specific moves that have been made since the August hearing. I would like to suggest that they be brought out in a detailed recital of these programs and I think it will be apparent at that time what moves have been made.

Mr. MAHON. We want you to give in the record at this time what funds have been unfrozen and what steps have been taken as the result of the sensational developments in Russia.

Mr. FLOOD. Though unimportant developments.

NEED FOR ADDITIONAL APPROPRIATIONS

Mr. MAHON. By way of the satellites, and so forth. Of course, we want to know if there is any urgency about providing additional funds at this moment. I have the feeling you have all the funds you need for the moment and that you can, in January, request any additional funds that you might need. I would like for you to say if you feel that there is an urgent need for additional funds at this time which Congress should provide for the acceleration of these programs. What would you say to that?

Mr. QUARLES. I would say we may very well be coming to you in January for certain additional congressional action.

Mr. MAHON. It might be for funds or transfers?

Mr. QUARLES. That kind of thing, exactly. We do not need to ask for them today. The absence of them today is not a material problem.

Mr. MAHON. Do you share that view, Mr. McElroy?

Secretary MCELROY. That is correct.

I think that Mr. Quarles has been somewhat hesitant to say some of the things that have been done. One of the things has been the determination to authorize the continuing testing of JUPITER.

Mr. FLOOD. Did I understand you to say that you only authorized the continuing testing of JUPITER?

Secretary MCELROY. You did not wait for me to finish.

Mr. FLOOD. Do you have something further to add?

Secretary MCELROY. I had planned to.

Mr. FLOOD. I will wait.

SOVIET FUEL DEVELOPMENTS

Mr. SIKES. There is one item of intelligence that I think the subcommittee is exceedingly interested in, and that is the matter of fuel. There has been considerable publicity about the development of a Russian propellant which is superior to that which we have. Are you going to touch on that later?

Mr. QUARLES. I can only say that we believe the Russians have been very active, as we have been, in the study of higher energy fuels, higher energy than the readily available hydrocarbons.

(Discussion off the record.)

Mr. MAHON. You can elaborate after lunch on that.

You are excused, and we thank you very much.

ACCELERATION OF JUPITER PROGRAM

Now, Mr. Secretary, you may continue your answer. You talked about the acceleration of the JUPITER.

Secretary MCELROY. I would just like to say that where they have been finding interferences because of the limitation on overtime, those have been removed; and we have instructed the three services involved to indicate to us—and they have been doing so—wherever there might be any other impediments which could be resolved by the Department of Defense.

I think Mr. Holaday will be able to explain those things to you in greater detail this afternoon.

NEED FOR ADDITIONAL PUBLIC WORKS

Mr. MCNEIL. You asked a minute ago about any possible action that might be requested of the Congress.

Mr. MAHON. Yes.

Mr. MCNEIL. One of the first things in any acceleration program is authorization for additional public works, and that is a problem to be taken up with the Armed Services Committee.

Mr. MAHON. We are only working on two ICBM sites. There are only two in the program that are any way firm. You cannot deter Soviet Russia with one site at Fort Cook and one at Francis E. Warren at Wyoming. Perhaps we have not done much at either place. If we are going to get operational we will have to get moving on more of these bases.

Secretary MCELROY. You can probably guess that you have caught us at a time when it is very difficult to give a final answer. Perhaps these things can be included in the 1959 budget. There is nothing that can be done in 1958. Until the decisions are made it is hard to give you a firm answer, but I would say that we are thinking not unlike your thinking on both the ICBM and the IRBM.

Mr. MAHON. Thank you very much.

We will resume this afternoon at 2 o'clock.

AFTERNOON SESSION

JUPITER VERSUS THOR

Mr. MAHON. We will resume our hearings.

Now, Mr. Holaday, I think that it would be good if I raise an issue with you with respect to the relative merits of the JUPITER versus the THOR. I get the thought that the Army feels that JUPITER should be favored, as between the JUPITER and THOR, for about four reasons.

(Discussion off the record.)

Mr. SCRIVNER. What is the big fundamental difference in the two? I have listened to both sides and no one has drawn me a very clear and concise picture of the exact difference between THOR and JUPITER, its structure, engines, guidance, and anything else.

Can you take us from the tip of it down to the base, or from the base up to the tip and say THOR has this and JUPITER has that and which is the better?

Mr. HOLADAY. I do not believe I can.

Mr. SCRIVNER. Can anybody?

Mr. HOLADAY. No.

Mr. SCRIVNER. How about Admiral Clark? He is nonpartisan in this now. He ought to be an unbiased witness now.

Mr. HOLADAY. I am trying to be an unbiased witness now.

Mr. SCRIVNER. He is in civilian clothes. He is not in either the Army or the Air Force.

Seriously, I think if somebody could just sit down and give us an analytical description of the two it would help to clear the differences.

Mr. MAHON. Why do you not give us the best you can now?

Mr. HOLADAY. I am going to let Mr. Waggoner do it. He has been working on this and I believe has most of the points at his fingertips.

Mr. SIKES. Can somebody tell us how many successful firings we have had of each missile involved? I am not talking about flights of a few hundred feet but of several hundred miles.

(Discussion off the record.)

MISSION OF THOR AND JUPITER THE SAME

Mr. SHEPPARD. In the designing of these two operations will you tell me which of the two vary one from the other in end results? Do they both accomplish the same end result?

Mr. HOLADAY. Yes. You are speaking now about the test program?

Mr. SHEPPARD. I am speaking about what they were originally designed for. Are they both designed to accomplish the same end result?

Mr. HOLADAY. Yes.

Mr. SHEPPARD. So far as the end result is concerned, whether you select the THOR or the JUPITER, you would have the same attainable end?

Mr. HOLADAY. Yes.

Mr. SHEPPARD. Why did the Air Force go into a production status before the fact was proven that they needed production on that particular item?

Mr. HOLADAY. This was due to the accelerated program the Air Force thought necessary to move ahead with. You have to put in

some production facilities anyhow. At ABMA we had production facilities to make ——— a month. When you discuss this, it is not really so far apart.

Mr. SHEPPARD. Is it the thinking on the part of your division that you literally need these two missiles to accomplish the same purpose?

Mr. HOLADAY. No, sir.

Mr. SHEPPARD. If you do not figure that way, why in the world are we spending the money to do it?

Mr. HOLADAY. These were brought in, as you will probably recall—the JUPITER, as a backup in case the THOR was not successful. Now, we have the unfortunate situation of having two ready to go—fortunate or unfortunate.

Mr. SHEPPARD. You have reached the stage now, as I understood the testimony this morning, where you have certain definite operations in one versus that of the other.

Mr. HOLADAY. Yes.

TEST RESULTS

Mr. SHEPPARD. If that is the case—and the fact is made clear that we needed guided missiles—why are we going any further with the worst 1 of the 2? It has already been proven that the worst one is now operational by test, I understand, and one has a greater degree of ability than the other.

Mr. HOLADAY. I do not quite follow you. If you would use the names I could probably follow you.

Mr. SHEPPARD. I am not in a position to know personally whether the THOR is a better proven project now than the JUPITER. But certainly from the evidence you have at this moment something is indicated as to which one of those is the most adaptable to the requirements. I would assume that would be true. Is that untrue?

Mr. HOLADAY. Well, I cannot answer your question specifically. As you understand, at the present time we are somewhat comparing potatoes and peaches.

Mr. SHEPPARD. I thought that they were both potatoes.

Mr. HOLADAY. I used the potato and the peach proposition as an example that you cannot make a direct comparison in the test programs up to the present time. The JUPITER, which has gone with a guidance system and a nose cone on it, sounds very good. On the other side, the THOR has made three flights. We do have all this manufacturing capacity back of the THOR. We may have to use it. You really cannot compare the two. They are not really going down exactly the same track at the present time.

Mr. SIKES. You have the manufacturing capacity back of THOR. I have had the feeling all along that you are going to build THOR whether the darned thing ever flies or not. That is not a good feeling to have. That is the reaction I have had.

Mr. FLOOD. I have never had any doubt about it. For 2 years I have had no doubt at all.

Mr. SIKES. You put your manufacturing capability behind this one before you were able to fly.

Mr. FLOOD. If you think that you are going to get JUPITER off the ground without THOR, you are crazy; no matter how long it takes.

Mr. SCRIVNER. I have been listening to these hearings for more years than you and I have reached a different conclusion.

Mr. FLOOD. You are going to get THOR, with or without guidance or pinwheels. That is the point.

Mr. SCRIVNER. I am tired of hearing talk about it. I don't care which one they have. But I do wish a decision would be made to get going.

Mr. FLOOD. The THOR program should have been abandoned. JUPITER would have been operational and in the field Easter a year ago.

Mr. SHEPPARD. With due respect to my colleagues, the thing that I was trying to establish was whether or not either one of these particular projects had reached a definitive status wherein you would feel justified in saying, "This is the investment that we are going into," and apparently from your statement you have not arrived at that position.

Mr. HOLADAY. That is right.

Mr. SHEPPARD. I am not interested in the past tense.

Mr. SCRIVNER. Why?

POSSIBILITY OF PRODUCING BOTH THOR AND JUPITER

Mr. WIGGLESWORTH. Assuming we need a given number of missiles and we need that number of missiles at the earliest possible moment, why is it not possible for you to reach that end by putting both into production?

Mr. HOLADAY. That is entirely feasible.

Mr. MAHON. And then you will never have to make up your minds. That is the beautiful part of it.

Mr. HOLADAY. One day one will have to drop out in all probability. I think we discussed that a bit when you were out in California. You understand that up until the Russians put their satellite up—and that has been in the past few weeks—we had on our books to produce only ——— IRBM missiles.

I, personally, cannot get much excited about all kinds of fancy manufacturing facilities and so on if you only have to make ——— missiles. When you say that you are going to make more, then things begin to change pretty fast, and neither missile has enough manufacturing facilities.

Mr. SHEPPARD. How long will it take you to reach a definitive answer with regard to this controversial question at the moment?

Mr. HOLADAY. Well, I would like to say something off the record.

Mr. MAHON. You may go off the record.

Mr. HOLADAY. Off the record.

(Discussion off the record.)

Mr. HOLADAY. At the present time, the advantage would be for Thor because of its larger production facilities back of it.

Mr. SHEPPARD. Do you consider that the present requirement, based upon whatever premise you want to use to value it, is indicative of the fact that there should be an intensification in at least 2 fields so that you can very rapidly determine which 1 is acceptable, or do you believe in the philosophy, let this thing roll along and it will take care of itself eventually? You are in the position of recommendation. In my opinion, that is quite a responsible contribution to the decision. I think that is your position. I may be in error. That is the way I interpret your position.

Mr. HOLADAY. I think this is true. Actually, neither one of these are just rolling along. Both of them are being pushed to almost the limit, and when you are doing research and development you just do not say, "Push and shove." You can go only as fast as a man's brain will work. More money will not make his brain move any faster. This is where we are on both of these programs. We have made mistakes and, therefore, we have got to recover and correct those mistakes. This is where we stand on both of these programs.

NEED FOR GREATER URGENCY IN PROGRAMS

Mr. SIKES. Let me ask a question right there.

It has been reported that the Russians are going to have IRBM's operational in Europe in 1958. We will be later than that. A lot of people think the Russians already have them operational in Europe. It would appear to me that, with a challenge of that sort, we must be doing more things and we must be able to do more things than we are doing now to catch up with that 1- or 2-year lag. Do you not feel that there are things we could be doing we are not doing?

Mr. HOLADAY. As far as the IRBM program and the ICBM program, we are doing, I believe, everything we possibly can. We are in the R. and D. stage. We just have to work our way out of these problems, and this is the case of just how fast can people think of the correct answer. Now, when it comes to really accelerating, I would say this: In my own mind, I think we are pretty well fixed; that both IRBM's will become operational. If we want to deploy lots of IRBM's, then it simply takes money to start up those production lines and start producing missiles.

QUANTITIES OF MISSILES NEEDED FOR TESTING

Mr. MAHON. You could produce more missiles of the THOR type and, probably, of the JUPITER and, therefore, have more missiles to test if you would give the people at Redstone and in Santa Monica the green light, could you not?

Mr. HOLADAY. It all depends on what you are going to do with the test. Are you just going to throw the missile down the range, or are you going to find out something when you throw it down the range.

Mr. MAHON. You cannot throw it down the range without finding out something, can you?

Mr. HOLADAY. This is true. At the present time, most of our delay between one launching and the next one has been changing and modifying the missile to get all the corrections into it we possibly could. We are using all those people, working them many hours overtime, trying to modify and get the next missile into being. Once we get into reliability testing, and once we make the missiles pretty standard, then we can launch several of them to get reliability. We did this recently on Thor.

SIGNIFICANCE OF GUIDANCE SYSTEM

Mr. FLOOD. What value or significance does guidance have? What relationship to the entire weapon does the element of guidance bear to the whole? We are talking about guided missiles, IRBM's.

Mr. HOLADAY. The guidance missile is identically the same. It is trying to send an airplane up without having a man in it.

Mr. FLOOD. You think the guidance system is a necessary condition precedent to the satisfactory firing of such weapon?

Mr. HOLADAY. It is all important.

(Discussion off the record.)

PROPOSAL FOR CRASH PROGRAM ON JUPITER

Mr. FLOOD. My idea a year ago or 2 years ago was to abandon THOR; put JUPITER, as unrefined as it is, into a crash program, with everything into JUPITER—money, brains, and everything—and put JUPITER in the field with troops, and then the second JUPITER and the third JUPITER and the fourth JUPITER would do all the things that you want done now.

Mr. HOLADAY. Oh, no. No. You are not going to lead me off like that.

Mr. FLOOD. I am not leading you. Of course, I do not mean that. Why was that not done? Why do we not have JUPITER operational in the field by Easter, with troops who are ready to fire it, even though it was not the beautiful, refined instrument that it should be?

Mr. HOLADAY. Now if we pour all the money that you want us to pour into JUPITER and start out to do it we cannot possibly get JUPITER in Europe at the earliest possible date. It would probably be someplace in December of 1959.

Mr. FLOOD. Right now there is no doubt about it. Right now that is right, but that would not have been right 2 years ago.

Mr. HOLADAY. Excuse me. That is December of 1958.

Mr. FLOOD. I am sure you are right. If, 2 years ago, you would have done this to JUPITER——

Mr. SCRIVNER. Why not let the witness answer?

Mr. HOLADAY. The JUPITERS, as you well realize, cost a lot of money, a million dollars or so, but the ground-support equipment that goes with it is going to cost you $2 for every $1 you put into the missile. When we start buying all this ground-support equipment and getting the missiles and then getting the personnel trained to use and deploy these missiles so that they can launch them quickly after they get a signal, we just can hardly beat that December date, regardless of how much money you try to pour into it. This, again, is taking people and their ability to do things, regardless of the amounts of money you have. I do not think that 2 years ago, if we tried to "crash" it, we could have done any better than we are going to do today.

Mr. FLOOD. With both of them?

Mr. HOLADAY. With either one of them.

Mr. FLOOD. That is the first time that opinion has ever been offered by anybody. You now say this to me: that, regardless of what had been done 2 years ago by centering on the JUPITER program, if you had taken Von Braun and given him a blank check and said "Go down in those Alabama hills and stay there until you come back with an operational weapon, no matter how refined it is, a weapon that will go 1,500 miles. I do not care how thick the skin is, I do not care what it sloshes or how refined the instrument is, I want one with troops in Europe that will fire 1,500 miles inside of 2 years. We will refine it for the next 10."

You say that that could not have been done?

Mr. HOLADAY. I do not believe it could.

Mr. FLOOD. So that engaging in the expenditure we engaged in with THOR along the same road, doing precisely the same thing, in no way detracted from a single-shot operation on a crash program on JUPITER.

Mr. HOLADAY. No, sir. I think they contributed to each other quite materially.

Mr. FLOOD. Then you had better make that statement public as of now, because it has never been stated that way before.

Mr. HOLADAY. I will make it public right now.

EFFECT OF WITHHOLDING OF FUNDS BY DEFENSE DEPARTMENT

Mr. MAHON. I would like to pinpoint this, Mr. Holaday: The funds that have been withheld from expenditure by the services are funds for greater production of the so-called experimental models. In other words, we were requested to provide certain funds last year by the Department of Defense for the missile program.

Mr. HOLADAY. Yes, sir.

Mr. MAHON. We were told in August, after we had provided the funds, that they were going to slow down the production rates for what was considered then, and probably now, as good and sufficient reasons, so according to you there has been no real slowdown in the technical sense of the scientific development program but there was some slowdown in the production program from the standpoint of the availability of dollars that you had; is that correct?

Mr. HOLADAY. That is correct. We have reserved that money. It is not being spent for something else. We have reserved that money so that if we decide that the missile is ready to go, we can take that money and immediately put in on the program of making hardware.

Mr. MAHON. How much money is involved in this picture that we are talking about?

Mr. HOLADAY. I guess we will have to wait for Mr. McNeil.

Mr. MAHON. At any rate it is a considerable sum of money?

Mr. HOLADAY. Yes, sir. Mr. McNeil has the dollars.

Mr. WIGGLESWORTH. That is for operational purposes and not for development purposes?

Mr. HOLADAY. That is right.

Mr. MAHON. It is not for operational but for production purposes.

Mr. WIGGLESWORTH. Production and operation. When you talk about slowing down the money that has not slowed down the development program one day or one dollar, has it?

Mr. HOLADAY. That is right.

Mr. MAHON. But it has slowed down the production of the missile?

Mr. HOLADAY. It is support. I guess a good way to answer you is that in one of these programs—in fact in two of them—we almost had hardware running out of our ears. We had more missiles ahead of us than we could possibly get modified and put down over the testing range and get information, so when we discussed this with the services they agreed and came up to actually slowing that down so that they could get along with their development work. We reserved that. Whenever they say our development work now is in such shape we can use more missiles, we will turn that production line back on again.

Mr. MAHON. Let me ask if this is correct. I would like agreement on this if it is correct. The Pentagon asked us for funds for the production of the IRBM and the ICBM. They got the money for that purpose. After they had requested it and secured it, they decided it would be more efficient and better for the defense program if they did not go ahead and expend these funds for these programs in the way that had been previously presented?

Mr. HOLADAY. That is right.

Mr. MAHON. All right.

Mr. WIGGLESWORTH. If you decided tomorrow to put one or both of these programs on an operational basis, you would need every cent of that money?

Mr. HOLADAY. Yes, sir, and some more, too.

Mr. WIGGLESWORTH. It would be there for that purpose?

Mr. HOLADAY. Yes, sir.

Mr. MAHON. It will be unfrozen.

Mr. FORD. That will be made available if this decision is made in fiscal year 1958?

Mr. HOLADAY. Yes, sir.

Mr. FORD. Which was within the contemplation of the budget, as submitted during the last session.

NEED FOR ADDITIONAL FUNDS

Mr. HOLADAY. Yes, sir. I do not want you to get the impression we may not ask you for more money in 1958. If we really want to go hard, we will have to have more money than you gave us.

Mr. WIGGLESWORTH. For operational purposes?

Mr. HOLADAY. Yes, sir.

Mr. MAHON. I think you would find it very simple, if properly justified, to get all the funds.

COMPARATIVE COSTS OF JUPITER AND THOR

Mr. SIKES. What is the comparative cost between the JUPITER and THOR?

Mr. HOLADAY. Per missile?

Mr. SIKES. Per missile.

Mr. HOLADAY. They are about the same. There are plus and minuses on that. They do not keep books exactly the same, so we cannot come out with the right answer.

Mr. FLOOD. Mr. Chairman, I am not clear on what you mean. I am lost on production as opposed to operation.

SLOWDOWN OF THOR PRODUCTION

Mr. MAHON. There were no funds, except through the emergency fund, for JUPITER, as you know. We provided funds with which to make THOR missiles. They were supposed to make them at a certain rate, and so they came down in August and said, "We have got the money to make these THOR missiles at a certain rate, but we do not think it is wise to proceed at that rate, so we are going to withhold these funds and slow down the production, the making, the manufacturing, the fabrication of the missile." Do you understand?

COST OF OPERATIONAL MISSILES

Mr. FLOOD. Yes. Added to the word "production" is the word "operational."

Mr. MAHON. Producing it for use is production.

Mr. FLOOD. After you make the thing, which is production, and stockpiling, then it becomes operational when it is with troops in the field.

Mr. MAHON. They make them for use in the field, not for test vehicles.

Mr. FLOOD. Wait a minute. That is the clear distinction that we must make. Production, as distinguished from operational, is going to involve an entirely new set of figures. Production, you gave the money for, to make so many a month. That does not mean anything except that they made them and they have stockpiled production. Now, they are no good stockpiled. They are no good in inventory until they are operational.

Mr. MAHON. That is right.

Mr. FLOOD. To make that weapon operational calls for an entirely new set of figures. What are we talking about now? What about that, Mr. Secretary? Which figure are you talking about—production figures or operational figures, or one figure which includes three things? Development, research, and development is (a); production is (b); operational is (c). Without the three things being present, this is an academic. What figure are you talking about now? What figure may you ask us for in January? What figure may you ask us for in the new budget?

Mr. HOLADAY. I will take your (b), which is the missiles used in research and development. Some of these are launched and some of them are not launched, and (c) is the operational missiles, which are the ones built and put into operation. A number of them, the first operational missiles, will be used for training purposes, for training troops. They will be either worn out during the training or we may launch a few of them. Then we make the missiles which are actually to go with the troops when they go to Europe. We have those categories, and your category (b) is the production facilities, which produces the Research and Development missiles, the ones for training and the ones to actually be deployed. We asked money for the missiles to be used in Research and Development, and the testing, and we had some money in there for building up the missile stockpile to go with the troops, and, also, a large proportion of the money was to do the ground-support equipment; large amounts. In fact, when we got into the operational we were asking for ——— for the ground-support equipment for every $1 we asked for missiles.

Mr. FLOOD. Then do I understand that in the 1958 budget, which you are now examining, you are going to spell out for us in X dollars, the amount of money you will want to place American troops, as operational units, firing these weapons, as stockpile and in their hands?

Mr. OSTERTAG. Are you referring to the 1959 budget?

Mr. FLOOD. 1959 budget, rather. Will the 1959 budget contain that figure?

Mr. HOLADAY. Not broken down in the detail that is outlined, I do not believe. We will have in the 1959 budget a given amount of money for the IRBM missiles, which will be a continuation of the research

and development and testing, and there will be a certain amount of money for training the troops. There will be a certain amount of money for so many missiles to go overseas to be deployed overseas.

1958 APPROPRIATIONS FOR MISSILES

Mr. FLOOD. Before you can deploy them overseas you must have ground support and you must have units already trained and you must have the hardware to do it, both for ourselves and our allied troops. At what point in the next 8 months and in what budget in the next 8 months are those dollars going to be requested?

Mr. MAHON. If I may interrupt, they have been requested already; have they not?

Mr. FLOOD. No, they have not.

Mr. MAHON. Yes, they have and we provided them.

Mr. FLOOD. Not at all, Mr. Chairman.

Mr. HOLADAY. Part of it you did. We asked you for so many missiles.

Mr. FLOOD. For production.

Mr. MAHON. For production of operational missiles. They already asked for money and got it.

Mr. FLOOD. Not 25 percent.

Mr. MAHON. They asked for some of that money. They have gotten some of it.

Mr. FLOOD. Mr. Chairman, we are short 75 percent of the figure that I want them to tell me about in the next year, the 1959 budget.

Mr. MAHON. We cannot say what is going to be in the other budget but in the 1958 budget we can have it.

Mr. HOLADAY. In your 1958 budget we do not have all these details, unless Al can find them. We asked for so many missiles for training purposes. I know that one. We asked you for ground support equipment, which was for training. This was to take care of the program in the money we are spending right now. In 1959 we will have a continuation of that, possibly, plus more missiles that will be used to go overseas.

Mr. SIKES. Can you begin any missiles under the 1958 program?

Mr. HOLADAY. No, sir. The current program at ——— ——— per month is strictly to support the research and development stage.

Mr. MAHON. The point you finally did not get to because you were interrupted was this: You have some money in the 1958 budget for the production of operational IRBM Thors.

Mr. SCRIVNER. If they withdraw the August directive.

Mr. MAHON. I say they have the money. We have given them the green light.

SLOWING DOWN OF PROGRAM

Mr. SIKES. Has not the August directive for slowing down the program been withdrawn?

Mr. MAHON. No.

Mr. HOLADAY. This is not a slowing down. I do not like that word.

Mr. MAHON. I know you do not. That is one way of saying it.

Mr. HOLADAY. Yes, it is. It was a reorienting of the program.

Mr. MAHON. Not with the idea of slowing it down, but with the idea of being more practical in your approach. The fact is you did

not obligate or use the money for the production of missiles that you had originally contemplated.

Mr. HOLADAY. That is right.

OPERATIONAL DATE OF MISSILES

Mr. WIGGLESWORTH. May I ask this question, Mr. Chairman: As far as the missiles are concerned you do not go to an operational basis until you get to such a point in the development program that you think it is a reasonable gamble to go into large-scale production, so to speak. Is that not a fact?

Mr. HOLADAY. That is right.

Mr. WIGGLESWORTH. When would you estimate that either one of these two programs will reach that point, where we will take the gamble in view of the need of getting the missiles we need at the earliest possible moment? Both of them are pretty near it; are they not?

Mr. HOLADAY. They are very near it.

Mr. WIGGLESWORTH. A matter of months?

Mr. HOLADAY. A matter of months; yes, sir.

Mr. WIGGLESWORTH. When you reach that point the money reserved can be poured right in for the construction of operational missiles?

Mr. HOLADAY. Operational missiles.

Mr. WIGGLESWORTH. And support and all that goes with it?

Mr. FORD. And support equipment.

Mr. HOLADAY. And support equipment. This was based at that time on only a deployment of ——— missiles. If we increase that above that we will come back and have to ask you for more money.

Mr. OSTERTAG. There is no point in producing support equipment until you have an operational missile?

Mr. HOLADAY. Until you know exactly which missile it is going to be.

Mr. OSTERTAG. That is what I mean. The support equipment has to be geared to that particular missile?

Mr. HOLADAY. Yes, sir.

Mr. MAHON. Mr. Riley?

Mr. RILEY. Mr. Secretary, you said, if I understood you correctly, that the ground support equipment would cost a great deal. Is that correct?

Mr. HOLADAY. Yes, sir.

Mr. RILEY. Off the record.

(Discussion off the record.)

STEPS TAKEN TO ACCELERATE PROGRAM

Mr. MAHON. This morning, Mr. Quarles and Mr. McElroy undertook briefly—and I think probably they were interrupted before they completed—a statement as to what has been done to expedite the situation in the light of the developments abroad.

Will you pinpoint, without interruption, generally speaking, what the major acts are having to do with the acceleration of the program, if any?

Mr. HOLADAY. I would like to comment on that because Mr. Quarles, I believe, did not have much time. He was being squeezed between his luncheon engagement, and I thought we might add to that some.

One of the things that we did—these are steps, now, from the August period down until we came down, what we have been doing to build it up, and I will add onto the end some of the steps we are doing now. The JUPITER was given a go-ahead after our decision of trying to sort out between JUPITER and THOR. It was given a go-ahead to continue with its research and development program and increase from ——— to ——— missiles a month and was also given the responsibility to continue immediately with the ground support equipment—the engineering of the ground support equipment to go with the missile.

You will recall that we moved in August to take and put a restriction on the amount of overtime. Now, to some people that looked rather serious. We have taken off those restrictions now, but there was a very good reason why we had a large amount of overtime in the start of these programs, and it came down. Mainly, we had people with very little training and experience, so that those people that did have this training and experience we had to use overtime.

As the program moved ahead we got more and more people trained, so they had this experience, and there was a natural decline in the overtime which was taking place in the programs. This was mainly due to the fact that we were able and capable to train more people as experts to do this work where we had been using people overtime to a great extent. We have taken off these overtime restrictions, but very little more overtime is being used by any of the services except at ABMA, which had a personnel restriction on it also. We also have instituted a weekly report proposition which permits the services to tell us exactly where their program is each week and to call to our attention immediately any point that is causing them trouble, where either relaxation, more money, or anything could be used to give them aid and assistance.

Mr. SHEPPARD. Are those conditions charted in your office so that you can keep in continuity with all of these reports and discrepancies that emanate from the field of production?

Mr. HOLADAY. Yes, sir. They come in each week. We summarize these and send to the Secretary and Deputy each week a summary of these things and tell them what actions we are taking to relieve any responsibility or what action has already been taken from the time we received a report. When we get a request like we did just recently from the Air Force, where they wanted some relaxation on the overtime, we acted on that and sent them the weekly report and said it was already acted on, to take off that restriction.

Now, as to the question of calculated risk: I think I was going to talk on that. That is the point we are studying right now, of when do we really accelerate the production of missiles to be available for overseas.

STEPS TO BE TAKEN IN DEPLOYMENT OF MISSILES

Mr. SHEPPARD. I think that is the point of this hearing. The other material is superfluous as far as I am concerned.

Mr. HOLADAY. That is right. We have been studying with the Navy, Air Force, and Army the questions of THOR, ATLAS, when is the proper time to get in the manufacturing facilities, when will we make more missiles, when we have one and know how to go on it. As I

discussed with you out in California, probably the first thing we would do would be to go on more than one shift in order to get material out. This requires training people. We would use that system, plus adding on later more machinery, more training, to get the production up. Production would have to go up on a slope. You cannot turn it straight up because you may have the machinery but you do not have the personnel trained. Then we have got to work also with General Schriver on accelerating his training. We are accelerating the training facilities at Camp Cook. He has got to get his top ranking people to do the training, bring them in, and do this training. There are several months of this. We have got to get this missile availability and the availability of troops geared together, and we have got to also fit this with our arrangements with our people in Europe, when they will permit us to come in and deploy these personnel.

Mr. MAHON. Are you doing more about that than you regularly planned before the sputnik?

Mr. HOLADAY. I should say we are. It occupies just about most of our time right now.

Mr. FLOOD. Why?

Mr. HOLADAY. So that we can have these missiles deployed at the earliest possible date under the best conditions.

Mr. FLOOD. Not because of sputnik? You are not doing anything because of sputnik. Don't you understand that?

Mr. HOLADAY. No; I did not.

Mr. FLOOD. Didn't you? Well, I did. Sputnik has not put a glove on you at all. Don't you know that? This is the program that you laid out some time ago. The timetable has not changed any. You are proceeding according to schedule. You are perfectly satisfied with it. You are trying to resolve an equation. Sputnik is entirely parenthetical.

Mr. HOLADAY. I did not understand that.

Mr. FLOOD. Were you here this morning?

Mr. HOLADAY. Yes, sir.

Mr. FLOOD. That is all, Mr. Chairman.

Mr. MAHON. Complete your statement as to other things that you have done to accelerate your program.

Mr. HOLADAY. I think, Mr. Chairman, that gives you about most of the things that we have done, except the many hours of planning that we are putting in here to fit together the real availability of these missiles.

Mr. MAHON. We have time factors here that we must not disregard.

AUTHORITY OF MR. HOLADAY

You do not have any authority as the so-called czar of the missile program to let contracts, I assume?

Mr. HOLADAY. No, sir. Those are let by the services.

Mr. MAHON. I am afraid that while you may be called in the press a czar that you still may not have the authority which you need to really get action. I would like to get your feeling on that. Mr. McElroy is here. I would like for you to tell us what the situation is. Do you have all the power you need to get the job done, to cut through red tape and get decisions?

Mr. HOLADAY. I think the answer to that is "Yes," if you are just not going to become a dictator. I do not think any of us want to become a dictator. The services have their programs and our work is to work with the services, to get a program that is satisfactory. Now if some program in our opinion is being carried on longer than it should, we work with the service and recommend it discontinue that program. With Mr. McNeil's aid and assistance, quite often we can control the money and expenditure of money, which gives us some control, I am quite sure.

AUTHORITY OF OFFICE OF SECRETARY OF DEFENSE

Mr. SHEPPARD. With your permission, Mr. Chairman, I would like to develop that a little further. It is my interpretation that the Office of the Secretary of Defense was created under the law with constitutional authority to determine what should be done by the respective services. May I ask you, Mr. McElroy, is that interpretation of the act under which you are presently functioning a correct interpretation, or a misinterpretation?

Secretary MCELROY. Well, I am a little troubled to answer that unequivocally but I will say that that is my understanding.

Mr. SHEPPARD. There is no reluctance upon your part to exercise the prerogatives under the law and the prerogatives given to you to function.

Does not that interpretation, if properly handled—and I am not saying it is not—place the Office of the Secretary of Defense in a position to determine what should be done, and to merely instruct the forces accordingly?

Secretary MCELROY. I do not think there is any lack of authority on the part of the Secretary of Defense in getting this job done, and I take it we are talking to the point you were questioning Mr. Holaday.

Mr. SHEPPARD. Yes.

Secretary MCELROY. Let me volunteer this, because I have been asked about the strength of Mr. Holaday's position. My belief is that the strength of his position derives from the fact that he is an assistant to the Secretary of Defense and as such has a call—I think he will find he has not found any reluctance on my part to lend it, where I needed to come into it personally—the call on the authority of the Secretary of Defense and the Deputy Secretary under the law has the same powers as the Secretary. I do not believe that there has been any reluctance of any one of us to support it.

Mr. SHEPPARD. I think under the law he does function in the absence of the Secretary. I have read this act many times to get definitive impressions out of it. There the responsibility is vested in the Secretary, and then delegated by the Secretary to the others.

Secretary MCELROY. That is my understanding.

Mr. SHEPPARD. That authority is delegated down to the Under Secretaries serving in your Department.

Secretary MCELROY. They call them Assistant Secretaries.

Mr. SHEPPARD. If we have any duplication of effort on the part of the military or reluctance on the part of the military to get out of duplication the authority is still vested in your Department to clean it up now, not tomorrow, if you so determine. Is that not true?

Secretary McELROY. I think there is no lack of authority.

Mr. SHEPPARD. Heretofore we have had a lot of vacillation about not wanting to hurt somebody's feelings. On the other hand, we get a multiplicity of complaints about this particular branch of the service, open competition, sometimes almost open rebellion, about a decision.

In the final analysis, if those things prevail, the authority is vested in your office to correct that if you so desire.

TRANSFERABILITY OF FUNDS APPROPRIATED TO THE SERVICES

Secretary McELROY. Yes. There has also to be considered the fact that moneys are appropriated to services, because if there are moneys involved—I am talking now of appropriations—any change of the type you talk about would have to take into consideration the fact that moneys are appropriated to services and they cannot flow back and forth except with the approval of the Congress.

Mr. SHEPPARD. In other words, do you not have transferability vested in your Department?

Secretary McELROY. Moneys are appropriated to individual services.

Mr. McNEIL. We could not switch Navy shipbuilding to Army——

Mr. SHEPPARD. Within the framework of a service, in this instance say the Navy, you do have jurisdiction on transferability for the functions within the services and also the responsibility of withholding the funds if you so desire?

Mr. McNEIL. Withholding but not transferring from one appropriation to another.

Mr. SHEPPARD. I grant you that, but within the scope of the appropriation itself you have transferability.

Mr. McNEIL. That is correct.

Mr. SHEPPARD. And in the final analysis you can withhold any and all funds you desire and have authority to do so.

Mr. McNEIL. Yes; but not between services.

Mr. SHEPPARD. Air Force and Navy; no. I was trying to establish whether or not in your opinion in the position you presently occupy you have authority to straighten out purported idiosyncrasies and your answer is you do have.

Secretary McELROY. I believe the authority is there.

APPOINTMENT OF "CZAR" NOT ALWAYS SOLUTION TO PROBLEMS

Mr. MAHON. There are those who feel—and I am concerned about it somewhat—that maybe the appointment of men as so-called czars may be not fully adequate to meet this present situation. That is a fact with which you have to wrestle in the Pentagon. Adding on additional layers of authority will not get the job done.

PRESENT DANGER OF SOVIET ATTACK

Mr. Secretary, I would like to ask this question, which bears upon the state of urgency involved in the present situation.

In the light of recent spectacular developments in Soviet Russia, are we in any real danger of being attacked now, or for 1 or 2 years, in your opinion? Do we have now, and will we have, sufficient deterrent to keep the Soviets in line for the present and for 2 or 3 years? I would like some comment on the degree of peril in which we now find ourselves. The President has said we live in not a moment of peril but in an age of peril, which, I thought, was well said. What is your response to this?

Secretary McElroy. My belief is, sir, that the major deterrent at the present time that we have is the Strategic Air Command and certain factors in the fleet air arm. I, personally, believe that is supportable by information summarized here this morning. We have the deterrent capability to give us what would constitute, under the calculation of an opponent who is making a hard calculation—I think we have to assume this would be done—ample deterrent to any attack on this country.

Mr. Mahon. At the moment.

Secretary McElroy. At the moment, and I would say I would believe that would be true certainly for a year, and I think, in my judgment, it would be equally true 2 years from now. But the further out you get, the more you have to calculate the speed with which he might be able to move with certain of his new weapons. Meantime, we are going to be moving with our new weapons, but you asked as of now. I do not believe we are in peril now because of any position on the part of our enemy that would let him, except by extreme miscalculation, decide to attack this country.

Mr. Mahon. I would like to have your comment, Mr. Quarles, on that subject.

Mr. Quarles. I think my comment would follow the Secretary's comment, except I would go a bit further than he expressed himself. I think it is demonstrable in cold military logic that we have today, and will have for a number of years to come, a position of deterrence that would make it clearly unprofitable for the enemy to start a war against us. One has to deal here in cold military logic, because what might happen as a result of psychological warfare in terms of defection of people on our side or on their side and problems of that kind, I am not meaning at the moment to weigh.

I think that there is nothing in the missile situation that we have been discussing that upsets that essential deterrent position, and nothing that we can see in the road ahead that will upset it, assuming that we proceed with our programs on schedule and assuming that neither side has any completely unforeseen technical breakthrough that can always upset a balance of this kind. I know of nothing that might do it, but, of course, we all have to admit that the future is unknown in that sense.

MUTUAL DETERRENCE

Mr. MAHON. We are in a period of what we call mutual deterrence. I was a bit shaken by the recent events and appraisals as to what the Soviets can do or will be able to do. I have felt confident in our position of mutual deterrance during the past 12 months, but I do not feel as confident about the next 2 years as I have previously felt as to our favorable position in the field of mutual deterrence. What is your reaction?

Mr. QUARLES. Favorable—you may be using that word, Mr. Chairman, in a somewhat different sense. There is nothing favorable to either side about this position, so I want to be sure I understand.

Mr. MAHON. If they can destroy the bomber that takes our bombs and they can hit us in vital areas overseas; that takes only 15 minutes; that worries me as to this business of mutual deterrence.

Mr. QUARLES. We all agree they can today, and they will be able in any years ahead that we can foresee, if they decide on an all-out venture, they could do us very great damage, no question about that. The only question is whether they could do us such an amount of damage so quickly that they would not themselves suffer irreparable and completely unacceptable damage. The answer to that is—this is not a casual answer; this is based on a great deal of very careful staff work—the answer to that is that there is no place that we can see clearly in the years ahead where they could, to their profit, undertake a venture of that kind, because they would be so terribly damaged in the process.

Mr. FLOOD. Mr. Chairman, I would like to say this. Is this what you mean? That for 2 years, no matter what they can do with IRBM's, no matter what they do to our advanced bases, if they can—say they can—our bombers are still going to get there, and they have nothing except their own bombers, but they have this missile which is going to hit continental United States where our bombers are for 2 years; is that not true?

Mr. QUARLES. I think that is true, although that is not just what I said.

Mr. FLOOD. But that is true?

Mr. QUARLES. I did not mention 2 years as a limitation. What you say will be true for 2 years, but I am making a broader statement than that. My statement includes the time when they might have missiles deployed of such range as to reach our continent. You still have to figure the accuracy of those missiles; how many of our bases they could knock out before our bombers could get off; where we will be at the same time with other forms of counteraction, both strategic from this continent, tactical from European deployments, tactical weapons all around their periphery, naval vessels of various kinds; you have to consider the whole picture.

What I am saying is, as far as military people can see down the road, can see this picture spread out definitely before them, there is no time when they could hope to knock us out and themselves avoid the kind of retaliation that would be completely unacceptable to them as a price to pay for the venture. This is what I call deterrence.

ALERTNESS OF SAC

Mr. MAHON. To what extent are we proceeding on a higher degree of alertness in the SAC and otherwise since sputnik?

Mr. QUARLES. Before sputnik we had alert experiments going on at SAC bases. I think the committee was briefed on that last summer. This was just certain selected bases to see how the thing worked out. I may say it worked out better than people expected it to.

That experimental work lasted on up into the fall. It has within the last month actually been considerably extended and is now in the process of being much more widely extended. However, as of this moment I cannot quote exact numbers of bases but it is still a thing in process and in the fairly early stage of implementation.

Mr. FLOOD. But sputnik had nothing to do with that.

Mr. QUARLES. I wonder if you would mind not putting words in my mouth. I will be glad to express myself.

Mr. FLOOD. I am not putting words in your mouth. I want to know, did sputnik have anything to do with that? That is a question.

Mr. MAHON. Please let him complete his response.

Mr. FLOOD. I thought he had or I would not have asked it. When you finish, answer mine. What did sputnik have to do with it?

Mr. QUARLES. If I might resume, Mr. Chairman——

Mr. MAHON. Proceed, please.

Mr. QUARLES. We are now in the process of extending these alert arrangements and some of the proposals that we will make in the 1959 budget will include the completion of these so-called quick response or alert arrangements on all of our SAC bases.

This will provide ideally for our bombers taking off within the expected tactical warning time that we would have if there were an intercontinental ballistic attack.

RECENT MODIFICATION OF PLANS

Mr. MAHON. To what extent have we modified our previously prepared plans and programs by reason of the firing of the Russian satellites and the additional intelligence we have received as to the firings of their missiles?

Mr. QUARLES. The facts are that we have stepped this thing up, and I believe the middle of October was the date at which the step-up took place. I cannot state a cause and effect here. I am not personally aware that sputnik was the controlling factor in the change that took place.

Mr. MAHON. All right.

Mr. FLOOD. Will you yield to me, Mr. Chairman?

Mr. MAHON. Yes.

EFFECT OF SOVIET SATELLITE LAUNCHINGS ON UNITED STATES MILITARY POSITION

Mr. FLOOD. Mr. Secretary, I was sitting quite at ease in my office in Wilkes-Barre when I received a very important telegram from the distinguished chairman of this committee a month ago that on the 20th of this month, today, at 10 o'clock in the morning this hearing would be held and it would be the new Secretary, you would be here, and

this distinguished array of talent, which would be followed by the uniformed personnel, which would be followed by a trip to Redstone which will be followed by shots in Florida. There are all kinds of conferences, I am advised, going on in the Pentagon; the President has made two speeches and is about to make a couple more. I was laboring under the impression that all of this took place because of a dramatic scientific breakthrough of extreme importance labeled "sputnik." I had the impression definitely that the only reason we are here is because whatever sputnik did blew the lid off something.

You give me the clear impression since 10 o'clock this morning, a very careful and considered judgment of yours, for which I have tremendous respect, that I am wrong, that that is not the fact, that certainly anything as dramatic as sputnik had some kind of effect but that under no circumstances are the American people or is Mr. Flood to have any idea that whatever is going on up until this minute in Washington or in the Department of Defense is to be related materially to sputnik. Isn't that it? I mean materially.

Mr. QUARLES. I know you do not expect me to comment on the reasons for your being here because those are, of course, your reasons rather than mine.

Mr. FLOOD. That is why I am here.

Mr. QUARLES. As for our own point of view about the matter, of course, there are two aspects to it. In cold military logic, I have given you the impression all morning and I will repeat it now, there is nothing in the launching of the sputnik that so changed our concept of what the Russians either are doing or are capable of doing as to cause us to feel that an entirely new approach must be taken to the defense problem.

It reinforces us in the view I have held all along, and frequently presented to this committee, that we are today exposed to a devastating attack on this country. We will continue to be exposed to a devastating attack on this country. It is exceedingly important for us to have in being and ready a deterrent striking force that will make it unprofitable for the Russians ever to exploit their military power.

This was my view before sputnik, it is my view today, and I am simply saying this to you. Our programs are calculated as best we know how to meet this situation and create a deterrent position, a defensive position, that will insure the enemy will not resort to such attack.

Mr. SIKES. Might I ask this question there?

Mr. MAHON. Proceed, please.

ANTIAIRCRAFT DEFENSE

Mr. SIKES. Our Air Force, and for that matter also our Army and Navy, have shown us pictures of their effectiveness in using missiles to knock down planes, All of them appear to have a considerably advanced state of effectiveness in being able to use missiles against planes.

If we still are dependent upon SAC as our principal weapon of offense at the moment, are we not in a somewhat vulnerable position inasmuch as we have had testimony before this committee that the Russian ring of defenses around their potential targets is more advanced than ours?

Mr. QUARLES. I am not aware, Mr. Sikes, that there is testimony that their defense is more advanced than ours.

Mr. SIKES. We have had this testimony before this committee.

Mr. QUARLES. For the purpose of this question, let's accept that.

Mr. SIKES. From the research and development people, we have had that information.

Mr. QUARLES. They have advanced their defense and their defense is being further improved and strengthened, no question about that.

Neither do we have an ability so to stop their bombers that they could not do devastating damage to us nor do they have an ability to stop our bombers so that we could not do devastating damage to them. This is a matter of simple logistics. Even if they stopped —— percent and even if we stopped —— percent, the result would still be true.

Now —— percent and particularly in a saturation raid, is an exceedingly unlikely outcome.

Mr. SIKES. I believe 30 percent was the highest loss we suffered on any strike during World War II; was it not?

Mr. QUARLES. We never got up to anything like that. We considered 10 percent a completely exorbitant price to pay for a raid, 10 percent attrition, in World War II. Of course, I realize conditions are very changed today and I would think that — percent was a kind of a minimum to demand of our defense position.

But, nevertheless, I want to make it clear that in spite of the greater difficulty of penetrating their defenses, that is all taken into account in the statement I made earlier about our position.

Bear in mind that as their defenses improve, our penetration ability improves by the process of greater electromagnetic countermeasures to confuse their defense, by the process of higher and faster planes, by the process of air-to-surface missiles which can attack their targets from distances beyond their ring of defense. All those things are factors in this situation.

The important point, it seems to me, is that while these very long-range missiles we speak of will progressively be more important, they are not in this near term of years—they are not the decisive thing in cold military logic, whatever decisiveness they may have in psychological warfare or in the psychology of people involved.

HEARING PROCEDURE

Mr. SIKES. What will be your procedure?

Mr. MAHON. We are not going to undertake to pass the witnesses around.

Mr. SCRIVNER. I am waiting for the comparison between THOR and JUPITER.

Mr. MAHON. Let's try to get that at Redstone.

I will recognize Mr. Sikes first.

IMPRESSION OF COMPLACENCY IN DEFENSE DEPARTMENT

Mr. SIKES. I have been disturbed about the picture of the satellite program, and the missile program. The people of our country are disturbed about it. I have read a lot of things that indicate to me

that you people in the Pentagon had really gone to work on this program to cope with this problem. I will be frank to say that I have been disappointed at this hearing today because it has not brought out a positive indication that this is the case. The activity may be there but I have not found evidence of it.

I know you men have the capacity to do it. You are very capable. I would like somewhere to see a listing of the things that actually are being done to move this program along. I would not be in the least reluctant to see you enter into a crash program in order to bring us up to date.

It may not be strictly essential for defense of this country, but it may be essential to keep our allies abroad from panicking under Russian propaganda. I think we ought to be letting the world know we are doing something definite to catch up. I would be very pleased to have a listing of specific concrete things that have been put into effect since October 4.

Mr. QUARLES. Mr. Chairman, I think Mr. Sikes has a very good point there. I am sure I have given an impression of complacency and business as usual but I do not mean to give that impression.

What I really mean to be saying to the committee is that in my book the programs we were talking about were top priority programs on October 1 and on September 1 and they are top priority programs today. They take on psychologically an even greater importance and the need for psychological response is obvious. I am quite ready to put down and show the psychological response. I agree.

EFFECT OF SATELLITES MORE PSYCHOLOGICAL THAN MILITARY

Secretary MCELROY. I would like to speak to that point, if I may.

I agree with what Mr. Quarles has said. There has been an attempt to keep this in a correct relationship to what has gone on in the past.

However, I think it can well be said from a reading of the report of Mr. Dulles' discussion yesterday that this is a preliminary to moving any further overseas—that steps are being taken for extended deployment of these missiles on European bases, that in order for us to be in a position to make good on any such agreements when reached it will be necessary for us to arrange for production of increased numbers of missiles.

As I said to you briefly at the end of the session this morning, Mr. Chairman, this catches us a little in the position between a couple of budgets, but we are not letting that bother us. We are working on the assumption that the action, whatever may be negotiated in December, will be an action which the American public will want to support and that we should and will be prepared to submit to Congress requests for any kind of authority needed to implement those moves.

I think it may be as well to get that said because it does involve something of the nature that I think you gentlemen have been reaching for all day. It has been hard for us to say it, but I think it must be said for our position to be understood.

When this stir in the world happened—my life has been involved with public reactions about as long as I have been working——

Mr. MAHON. Be careful not to insulate yourself at the Pentagon.

Secretary McElroy. We are all very conscious of impacts on the world being possible by a spectacular technical achievement as well as by the show of force, for example, you might have from the appearance of an aircraft carrier off a couple of ports. There are a variety of ways. We do not discount this as an important thing in world balance of power. But what we have tried to say here, Mr. Quarles I think very well, is that it is a great deal more in the area of world public opinion that this effect has been felt than in any major change at this time in actual world balance of military power.

If we can say it in those terms, I think we have said what a good deal of this that we have been saying today has tried to carry to you.

EFFECT ON PERSONS IN OTHER COUNTRIES

Mr. Sheppard. Just one question. I think your statement is compatible to a reasonable degree with the situation. However, from a congressional point of view, as I see it individually, Mr. Secretary, we spend literally billions of dollars in bolstering ostensibly the economy of nations but their morale and allegiance to our principles of existence was a component part of the total. I do not think anybody, including yourself, but would agree that this recent exposé of Russia's ability has worked detrimentally insofar as Asiatic mentalities are concerned and perhaps others. Do you agree with that?

Secretary McElroy. I do accept that.

Mr. Sheppard. Irrespective of the mechanics to which the gentleman referred a moment ago, as propounded by the Department as of last October—I think you used that date—the actual mechanics militarily speaking is one thing. But over here is the other contributing factor, which a tremendous amount of money has been spent on. Now there is a controverting situation here depreciating the values, and even if something only psychological, something must be done.

My interpretation of your statement was not based on the fact there was lethargy in the way you expressed your views about following a semipreestablished, cut and dried program. That was not your intention to convey that.

Mr. Quarles. No.

Mr. Sheppard. Because there are so many other considerations to the total that obviously made it necessary to accentuate the program to some degree. I think psychologically, if nothing else, that is definitely in the making, and that is apparently what you people are determined to do, and as of the moment you have not established the determination of what you are doing.

Secretary McElroy. I think I can say I agree with what you said.

Mr. Mahon. Mr. Wigglesworth.

ADEQUACY OF PRESENT RATE OF MISSILE DEVELOPMENT

Mr. Wigglesworth. I have a newspaper article in which Dr. von Braun is said to have made this statement:

> In the ballistic missile field the United States about 2 years ago embarked on an all-out crash program which will be difficult to substantially accelerate beyond its present pace.

Is that a fair statement?

Secretary McElroy. What was his timing on it, Mr. Wigglesworth?

Mr. Wigglesworth. About 2 years ago.

Secretary McElroy. I do not know about that time, but when was the high priority established?

Mr. Quarles. A little more than two. I believe it is a correct statement that it was made primarily in relation to the development of effective weapons as distinguished from the deployment of these weapons.

Mr. Wigglesworth. He also is quoted as making this statement: "I believe that by and large our five key ballistic missile programs—JUPITER, THOR, POLARIS, ATLAS, and TITAN—could not be speeded up appreciably by increases in funds." Is that a fair statement?

Mr. Quarles. I would say that it is a fair statement in respect to all but POLARIS, provided again you interpret it as speeding up of the research and development of these systems, which I think the context will show to have been his meaning.

In respect to POLARIS, while I think Dr. von Braun has good reason to believe what he said, actually it develops that we can put somewhat more money into a speedup of the POLARIS research and development program.

Mr. Mahon. Dr. von Braun was not saying, as I understand your testimony, that we could not speed up other phases of these programs. He was speaking, as you say, I believe, only of the research and development on these missiles.

Mr. Quarles. That is my understanding of what he said.

Mr. Wigglesworth. Which is the present state we are in.

Secretary McElroy. Yes.

OBLIGATIONS FOR MISSILE PROGRAMS, 1946–58

Mr. Wigglesworth. I wish Mr. McNeil or somebody would furnish for the record a table that will just show the dollars we have expended in the ballistic missile field, appropriated and expended, starting say in 1945 and bringing it down each year through the current fiscal year 1958.

Mr. McNeil. Very well.

Mr. Ostertag. Including research and development?

Mr. Wigglesworth. The whole thing.

(The information referred to follows:)

Obligational program for missile systems,[1] fiscal years 1946–57

[In millions of dollars]

[NOTE.—Each successive classification is contained within the broader classification in the following column]

	IRBM and ICBM program	Long-range surface-to-surface missile program	Surface-to-surface missile program	Grand total, all missile programs
Fiscal year 1946 and prior	(2)	7	19	70
Fiscal year 1947	(2)	6	20	58
Fiscal year 1948	(2)	10	36	81
Fiscal year 1949	(2)	12	45	98
Fiscal year 1950		16	65	134
Fiscal year 1951	0.5	70	186	784
Fiscal year 1952	.8	103	240	1,058
Fiscal year 1953	3.0	179	406	1,166
Fiscal year 1954	14.0	213	350	1,067
Fiscal year 1955	161.0	330	559	1,479
Fiscal year 1956	515.0	591	902	2,270
Fiscal year 1957	1,365.0	1,587	1,968	4,470

[1] Program data contained in this table cover the developmental and capital costs involved in missile programs, i. e., the cost of bringing missile systems to an operational status plus the costs of procuring missiles for operational purposes. These figures include all procurement, construction, and research and development funds directly associated with missile programs. These figures do not include military pay, operation, and maintenance costs for operational missile units and sites and include only those shipbuilding and aircraft costs directly associated with providing missile capability.

[2] Excludes $2,300,000 programed in fiscal years 1946–49 for the Air Force MX-774 ballistic missile research program, which was a precursor to the Atlas ICBM.

Mr. MAHON. Mr. Scrivner.

Mr. SCRIVNER. I have 1 or 2 questions. First, I want to welcome Secretary McElroy to his first appearance before this committee. He received a rather modest baptism of fire. Of course, we realize in the very short period of time you have had your new position it is not possible for you or anybody else to get a full and complete grasp upon the job which you now have. So that it has been only proper that we should direct most of our questions to those men who have had more experience and more detailed knowledge such as Secretary Quarles and Secretary McNeil.

BASIS FOR UNITED STATES DEFENSE EFFORT

Going back to Secretary Quarles, I do not pretend to be or to have recently become an expert on satellites, either civilian, scientific, or military. But knowing the background, primarily the background, of our Vanguard program and knowing, as we have been told, that it had no part in our military ballistic program, I have not become overly worked up over what has developed through the orbiting of two Russian satellites.

I do realize, of course, the tremendous psychological impact it has had. It has become quite a popular thing to talk about. I have talked about it some and I expect to talk about it some more. Others will, too, but perhaps 6 months from now again will be demonstrated the fact that there is nothing deader than the headlines in yesterday's newspaper. I expect probably many of us will be hard pressed to just reach out right now and say what it was we were worrying about 6 months ago that was carried in the headlines of the paper.

My own feeling has been this: That if we, the United States, permit all of our programs to be varied, speeded up, stopped, distorted,

changed, modified or magnified, by anything that another nation does, that then we are no longer in control of our own program and that the other nation is calling the shots and we, if we follow them, are dancing to their tune.

Mr. QUARLES. I think that is right. We want to play the game on our own ball field.

UNITED STATES MILITARY STRENGTH

Mr. SCRIVNER. We have to. We have to look at our own problems, our own situation, and find the answer to those problems and then depend more upon ourselves and formulate our programs accordingly and not because somebody makes some spectacular dash. We should not immediately say that we have been a complete flop and we do not have a darned thing. That is not the fact. We do have many things and we are not only as strong, but a little stronger today, than we were the 1st of October—militarily.

The orbiting of two satellites has not weakened our military posture in the least.

Are we not as strong today as we were the 1st of October—militarily?

Mr. QUARLES. Militarily there is no doubt about the truth of that statement.

Mr. SCRIVNER. I do not know who used the word "complacent." I do not think you are. I know that I am not. I realize and you realize that because of the nature of a dictatorial nation like Russia we have a very formidable opponent and one that we cannot afford to—and I am sure the military does not—underrate in any way, shape, or form. I do not know why all of a sudden there should be so many people feeling that we are almost all of a sudden overnight absolutely helpless, that everything is so hopeless, and I refuse to believe that for a fraction of a second.

Mr. QUARLES. I do not believe it and I really doubt that there are very many people who do believe it.

NEED FOR PSYCHOLOGICAL STROKE BY UNITED STATES

Mr. SCRIVNER. What some of our allies might think as a result of this is something that they themselves must determine. Perhaps some place in our makeup something even more spectacular than General LeMay's flight must be done to again attract headlines. That is about what it amounts to. With all of the skill that we have in the advertising world I am sure that somebody will come up with something.

(Discussion off the record.)

THOR VERSUS JUPITER

I have not liked some of the indecision that has been prevalent. I know that Mr. Holaday has a job to do. I know that there are many factors involved, and that is one reason why I wanted somebody to tell me exactly what is the big difference between THOR and JUPITER. From what I have been told there is not a lot. There is not a tremendous big difference between the two. I have a sneaking suspicion

that there is not nearly as much difference as the public clamor would have us believe. That is why I made the request this morning for somebody to sit down and say—this is in THOR and this is in JUPITER, that is in JUPITER and that is in THOR.

Mr. MAHON. Mr. Waggoner will do that before we adjourn this afternoon.

Mr. SCRIVNER. All right.

EFFECT OF INTERSERVICE RIVALRY ON MISSILE PROGRAM

Mr. FORD. Mr. Secretary, I think the public is more concerned about this than almost anything, and that is, whether or not in the opinion of responsible people in the Pentagon has there been any slowdown, any waste in our missile and satellite programs as a result of conflict between the various services?

Take, for example, the IRBM program. Has the problem of THOR and JUPITER resulted in any slowdown, or lack of progress, and has that dispute added additional unnecessary costs now and for the future? You can include the POLARIS program, if you want to.

Secretary MCELROY. I would like to talk to that point because it is one that I am interested in and I am fresh on it. Mr. Quarles can express his own views.

I have discussed this a good deal also with other people such as Mr. Holaday. I have not found any of us internally who believes there has been any slowdown in point of time on the IRBM, or the ICBM development because of the competitiveness of the services. We think it is distinctly possible there may even have been some acceleration because of the desire on the part of each of the respective services involved to move more rapidly than the other services. I do not think the POLARIS program was ever expected to come along on anything like the program of the other two because the POLARIS program was predicated upon the development of a solid propellant. A solid propellant we knew could not come on the same schedule as the liquid propellant for rockets so we are really talking in this instance about the Air Force program and the Army program.

We genuinely do not believe, despite certain impressions of the public—and I know they have them—there has been any slowdown in the development of our IRBM's or ICBM's as a result of that competitiveness.

On your second point about whether the money might have been spent more wisely, there, too, I believe that I express the views of those who have been closest to it that there has not been a waste of money. If you decided in the beginning that you should follow two paths in order to be certain you got one of them successfully in operation in the optimum time, and made that determination, I do not believe there has been any real waste of money as the result of there having been competitive services. However, I agree with you the public has the reverse opinion, and I do not think you can talk them out of it because I think there has been too much chatter from the service-connected people which has sort of contributed to an impression of this kind.

BENEFITS FROM HAVING MORE THAN ONE APPROACH

Mr. FORD. Would you say that some advantage perhaps has been gained in time because of this method of handling it—the Air Force with the THOR and the Army with the JUPITER program?

Secretary MCELROY. Well, I cannot authenticate that. I think that I would rather let it stay on the basis that I personally feel quite confident there has been no loss of time as a result of this program having been handled by the two services as against the possibility of its having been done by one. I think it is an unfortunate thing, however, that in the course of this parallel development by two services the impression has been given to the public, and inescapably it has been, that the program has been damaged by the competitive service aspect of its development.

Mr. QUARLES. May I add a word to that? Of course, we have two programs so that if one fails, we would have a good one. Now, if neither program fails, perhaps there has not been any great saving in time. Of course, that is in retrospect. If we had only one program and that program had failed, then, of course, there would be a great saving in time by having introduced another program that did not fail. So the saving in time is the potentiality that one of the programs might not have been successful.

Mr. FORD. I think the situation goes to prove, Mr. Quarles, that Monday morning quarterbacks can always call signals successfully on Monday. The unfortunate part of it is Monday morning quarterbacks never won a game, they never played one, and, of course, they have not been under the gun, or under the pressure of calling the signals when the heat was on. They can only do it over a cup of coffee on Monday morning or Monday afternoon. I personally have little sympathy with Monday morning quarterbacks, their strategy, or their subsequent decisions.

FUTURE FUNDS REQUESTS

But let me just add one thing: Are we getting the correct impression. Will there be a tremendous increase in research and development fund requirements in the future, and secondly, can we anticipate in the production and procurement items a tremendous increase in fund requests?

Mr. QUARLES. Are we talking only about the missile program?

Mr. FORD. Missile and satellite, but primarily missile at this time.

Mr. QUARLES. I think in the long-range missile programs, and exclusive of POLARIS, the additional moneys will be primarily in acceleration of production and deployment rather than in development because, as has been brought out many times, the present support of the development program is substantially all that can be usefully applied. But there will be additional money for accelerating deployment of both the IRBM and the ICBM weapons. In the Polaris program, as I mentioned earlier, there will be additional money for the acceleration, both of the development and of preparation for the deployment—ship arrangements for the deployment of the weapons.

VALUE OF POSITIVE PROGRAM

Mr. FORD. One final comment: I personally feel that even at home our greatest loss is psychological because of the launching of the sputnik. I think the public would support a program better not from fear but from the psychological lift on the affirmative side. How can we do that with what we have available and what we will have available? I think any program you submit would get a better lift, better public support, if you had an affirmative psychological push rather than one that is predicated on fear and apprehension.

Secretary MCELROY. If there is a successful negotiation—and I hope there will be—of the agreements referred to by Secretary Dulles yesterday, and if on the basis of that there were a positive program of the nature that you are suggesting, and I agree with it, it would indicate an early deployment of IRBM's in a number of European countries with all that would mean in terms of added deterrent power, and that might be in the nature of what you are suggesting.

As I say, we would expect that the kind of thing that Secretary Dulles hopes to achieve by negotiation would be supportable under a program we would submit to Congress.

Mr. MAHON. Mr. Ostertag.

Mr. OSTERTAG. Mr. Secretary, I would like to bring back into line our discussion with regard to the effect of sputnik and to inquire whether or not the successful launching of this satellite on the part of Russia discloses rocket or missile capability on the part of Russia that we did not already know they had?

Secretary MCELROY. If that is an intelligence matter, I am going to ask Mr. Quarles to answer that.

Off the record.

(Discussion off the record.)

SCIENTIFIC TRAINING

Mr. MAHON. Mr. Secretary, is the Department of Defense doing anything at present in regard to the adequacy of scientific training in the schools and otherwise? Some consider that, in the long range, perhaps is the greatest threat to our country. Is there anything new on that?

Secretary MCELROY. We have begun, of course, immediately a close consultation with Dr. Killian and we also are supporting the development of programs by the Department of Health, Education, and Welfare that would touch this area of education. We do not plan, with the exception of the indirect influence——

Mr. MAHON. The Cordiner Committee approach.

Secretary MCELROY. That, plus a greater encouragement for basic research which in many instances involved some support from university programs which indirectly can improve the quality of teaching all around the country. But that is about the way in which I think we are participating. We do not regard it as our responsibility to implement it, but we are encouraging others whose responsibility it is.

MISSILE LAUNCHING FACILITIES

Mr. MAHON. This morning I did not get to finish my interrogation regarding the ICBM bases. We are going to get into the ICBM's and there is no doubt we are going to perfect it. We are going to need the bases and we have only two of them. Maybe we are planning for ——— more. To have a real deterrent and to have a sufficient operational ability you have to have some bases. Are you planning to accelerate that in some way, or do something specific about it?

Secretary MCELROY. We are thinking of an expanded ICBM as well as an expanded IRBM production program.

Mr. MAHON. But the decisions have not yet been made?

Secretary MCELROY. They have not been made, though they have been tentatively made in anticipation of budget considerations.

Mr. FLOOD. I want to direct your attention to the question Mr. Ford asked you. You are very new in town.

Secretary MCELROY. That is a fact.

INTERSERVICE RIVALRY

Mr. FLOOD. I do not want you to get in trouble too quickly.

I direct your attention to the speech made by the President, the first speech he made. It was in four parts.

Part 3 of that speech—and he indicated himself that was perhaps the most significant part and the American press indicated it was the most significant part—dealt entirely with the concept that one of the chief factors with which there was trouble—and there was trouble so he said—was the animosity, the jealousies, the squabbling and fighting between the three branches of the services, and he said that that was so, and he told the American people that was so, and he said it was very bad and the American people thought it was very bad, and he said that it is so bad that I am going to name Dr. Killian, who is going to do several things. Among the several things that he is going to do, and one of the chief things he is going to do, is to knock heads together and prevent this business from going on.

Mr. SCHRIVNER. That is not what the President said. If you are going to quote the President, you ought to set out his speech and let the Secretary comment on it.

Mr. FLOOD. Suppose you do that, and I will go on from here.

Mr. MAHON. All right. Let us proceed.

Mr. FLOOD. That, I recall, to help my disturbed friend from being disturbed further, is my best recollection of what he said. That being the case, you came here this afternoon and, in reply to Mr. Ford's question, contradicted the inference that I drew, flatly and categorically, and said, "That is not so at all." That is a bad way to begin in this town. That is the boss.

Secretary MCELROY. Are you asking me that?

Mr. FLOOD. Yes.

Secretary MCELROY. I think that there are unfortunate aspects to the interservice rivalry. The question that was asked me was a specific question. The question was did I believe that there had been any slow-

down in the development of our ballistic-missile program as a result of interservice rivalries. I am sure that I have not had any conflict in my reply with what the President believes, and, if you will look at the President's speech, I am sure you will find that there was no reference in the President's speech to the effect of interservice rivalries on the development of the ballistic-missile program.

Mr. FLOOD. Then you are not suggesting that he was talking to the American people about something entirely different, are you?

Secretary MCELROY. I think he was talking in general terms, in which I would agree with him.

Mr. FLOOD. Mr. Chairman, this I construe—well, never mind what I construe. You will have to do better than that, Mr. Secretary, in this town.

Secretary MCELROY. I will try.

Mr. FLOOD. Yes, sir.

MISSILE PROGRAMS OF OUR ALLIES

Mr. Secretary, what about our allies? What are the British or French or Italians or anybody else doing with missiles? Is there anything good or interesting or ——— ———.

LONG DURATION OF DEFENSE PROBLEM

Mr. Secretary, here is one thing I wish you would do somehow, if you think it should be done, on this question of an emergency. I believe, unfortunately, that the American people believe in their hearts that whatever we are going through now is another emergency. I think they are satisfied that they will go to Atlanta, Miami Beach, or the mountains and come back in 2 or 3 weeks and this will be all over. I find no desire on your part—and again this is one of those "you's"—to try to say and do things to convince the people of this country that this is no emergency; that this is going to go on as long as they live. They do not think that. They do not believe it. I do not know how you are going to do this, but one of the most important problems we have is to convince the people of this country that this is not like gas on their stomach. They are not going to take a deep breath and this is not going to go away.

They believe that. I do not know how in the world that will be overcome. That will be one of your big problems; to convince them that this is going to go on and on and on and, probably, get worse before it gets better.

Mr. SCRIVNER. You and I, for a change, are in agreement. I have told my people at home this is a cross they will need to bear for the next five decades, at least.

Mr. FLOOD. It is very bad. I left a dinner at my district last night of 500 people who are high above average I. Q. They knew I was coming here. They say, "Why don't you go down and take care of this and we will come back from Florida and it will be all right?" This is an emergency, another crisis. They have no idea what the problem is.

You and I had a little problem this morning. A long time ago—it seems like a hundred years—I was one of the believers in a Man-

hattan project, or whatever you want to call it, for this business we are going through. Somebody else said, "We won't do it that way. We will do it this way." That is the way we are doing it. That is the end of that arrangement. That was years ago.

DEVELOPMENT OF ANTIMISSILE MISSILES

Now, I have lost interest in missiles for the moment. I know that you are going to shoot missiles this month or next month or whenever you get to it. You are going to shoot everything you want to shoot, and everybody else is going to shoot. I am not interested in that right now. What I am interested in is antimissile missiles. I am interested in the next thing. I have been interested in that now for just 1 fiscal year, with any great excitement. But I am afraid that you people are going to do the same thing with antimissile missiles that you have done with missiles. Of course, if you think you have been right with missiles, then I suppose you think you will be right with antimissile missiles. I hope that you will not do the same thing with antimissile research and development and production and operations that you have done with missiles, because I think you were wrong.

Is there any hope that I may get what I want on antimissile missiles; that we will have one operation directed and devoted and dedicated to antimissile missiles? Here is a blank check. Go up in the mountain and stay there until you come down with some kind of an operational antimissile missile.

Mr. MAHON. Let him comment.

Mr. FLOOD. What about that?

Secretary MCELROY. I do not see, of course, how we can hope to get the blank check.

Mr. FLOOD. Skip the blank check.

Secretary MCELROY. The operation we propose for research and development of the antimissile missile and of various satellite applications, not just the ICBM and satellite, but things in general, is an organization which should do, if we are any good in setting it up, and we expect to be the best we can be, will do the kind of thing you are talking about. As I say we do not like to talk about a Manhattan project because there are too many things about the Manhattan project which could be done in war which cannot be done in peace.

Mr. FLOOD. If that is your thinking I will settle for that.

Secretary MCELROY. We call it a single-manager concept.

Mr. FLOOD. I will settle for that right now. That is good.

Mr. Chairman, I wrote a letter some weeks ago including a copy of Alsop's column. I think a great deal of this we have developed somehow or another in the course of today's hearings. Ninety percent of it was developed. There is not much sense in torturing this, I do not think.

Mr. MAHON. Let us see if we cannot bring this to a conclusion very quickly.

SPEECH OF SECRETARY QUARLES

Mr. SCRIVNER. I would like to have Secretary Quarles insert in the record at this point the pertinent information of a speech that he made

in New York last night or the night before, about the Russian satellite and some other items.

Mr. MAHON. All right. Will you do that, Mr. Quarles?

Mr. QUARLES. Yes, sir.

(The speech referred to is as follows:)

REMARKS BY DONALD A. QUARLES, DEPUTY SECRETARY OF DEFENSE, BEFORE THE WINGS CLUB, NEW YORK, N. Y., MONDAY, NOVEMBER 18, 1957

It is a very great pleasure to be here with you this evening and a very great honor to be the recipient of the Wings Club Award of Merit. Reason, of course, tells me you have been overly generous in your appraisal, but I confess to you that something deeper in me than reason is touched by your kind words and warm welcome. My appreciation is all the keener as I look out over this audience and see so many whose esteem I would particularly value.

The first suggestion that I might join you here this evening came last May. Pleased as I was, there were so many uncertainties in my path between May and November that I had to beg for time. For one thing, I wanted to be sure that the vicissitudes of Washington life would leave me persona grata until the date of your meeting—a point you have been kind enough to resolve in my favor. The other uncertainty had to do with what we call the climate in Washington. On this point I decided late in August that the almanac forecast for November did not look too bad. All of which proves I was using the wrong almanac, because things certainly started happening shortly thereafter which, even in Washington, would be called bad weather.

But it's an ill wind that blows nobody good so let's have a look at it. I hope I can clarify some of the issues that have been raised. At any rate, I can give you my own point of view about them, realizing that I have a very knowledgeable audience that will readily fill in any of the pieces that I have to leave out if I am to stay reasonably within bounds of your program this evening.

While the analogy is by no means perfect, one might compare the dawn of the space age, which we are now witnessing, with the period some 50 years ago when aviation was experiencing its early growing pains. I certainly would not prophesy that outer space activities in the next 50 years will parallel the phenomenal developments of air vehicles in the past half century. On the other hand, I would not wish to play a role at this time comparable to the role played 50 years ago by those officials of the Military Establishment who took some time and had great difficulty in reaching the conclusion that aviation might possibly have some military value. The world has changed and we can no longer enjoy the luxury of that kind of cautious conservatism.

In addition to the impact of the completely unpredictable growth in aviation during this past period, the two world changes that most force our hand today are, it seems to me, the development of atomic explosives and, in the political field, the challenging position of the Soviet brand of monolithic and aggressive communism. In combination, these things have revolutionized the world environment in which we must live and, at least in the defense business, our actions and reactions must be conditioned by them.

Before talking further about the new space age, perhaps we should define what we mean by outer space. For our present purposes I suggest we distinguish it from the airspace by noting that craft in outer space will be so little influenced by the atmosphere in the near vacuum in which they move that their motions will closely follow Newton's and Kepler's laws, whereas aircraft will carry wings which depend on aerodynamic forces, not to mention the fact that most of the aircraft have air-breathing engines that depend on the oxygen in the air for combustion of their fuels.

This puts such things as the long-range ballistic missiles and the earth satellites in the space-craft category, and I am sure you have been waiting for me to mention these items. While Sputniks I and II were by no means the first space craft, since many ballistic missiles launched by the Germans, Russians, and ourselves had preceded the satellites into outer space, the satellites are very significant in that their period of escape from the atmosphere is measured in days or months compared with the few minutes of ballistic-missile flight.

I trust that I have not offended your honorable organization by defining space craft in such a way as to outmode wings. I note, too, that one of your con-

stitutional purposes is to "provide for the advancement and development of aeronautics, domestic and foreign," and I must invite your attention to the need for an amendment of your constitution to include astronautics as well as aeronautics, and, further, to remind you that outer space should be quite international in character, so it would be anachronistic to refer to it as either domestic or foreign. If you would like a suggestion from the Pentagon as to how to get a constitutional change like this made on a timely basis, I would suggest that you appoint an ad hoc committee to study the matter.

I have now used up all my excuses to avoid talking about sputniks. You will understand my reluctance when I remind you that, so far, no one in the administration has yet succeeded in saying anything about sputniks that the critics didn't tear to pieces. Perhaps I should start off by admitting that I have long had something of a passion for astronomy; in a mild form, I am a stargazer; satellites affect me emotionally, and I can feel the allure of space travel, although not irresistibly, I must say, Moreover, I had enough information about our missile and satellite programs to be impressed by the Russian sputniks. They are a significant technical achievement, significant in themselves and significant as an indication of the state of advancement of their military rocketry. It is no disparagement, then, to say that they have little or no other military significance. They do not prove that the Russians are more advanced in military rocketry than we are. Even if they did, this would be a minor, rather than a major, factor in the near-term balance of military power. There is a long step from the testing of such rocketry to the deployment of acceptably reliable, accurate, and, therefore, sound, atomic-weapon delivery systems based on rockets of intercontinental range. I have no doubt both they and we will develop such weapons, and I do not expect that there will be a significant time difference either way. The important thing to remember is that, even after such weapons start to become available for some time to come thereafter, manned bombers will dominate the strategic delivery scene—and our strategic delivery position is now and will continue to be a sound deterrent position.

And so, when we place Sputnik I and Sputnik II in proper perspective, we must regard them as first and exciting probings into the mysteries of outer space. We must expect to see American satellites, as well as additional sputniks, orbiting in the reasonably near future. And, no doubt, satellites will get to be progressively more elaborate and sophisticated.

One rather important point that I alluded to earlier seems to have already been established by the fact that sputniks have now overflown practically every nation on earth many times. This point is that outer space is international space, and that satellites traveling in orbit in outer space are not offensive in character and, therefore, do not violate the sovereignty of the nations overflown. This is an important point and, as I said, one in which the sputniks have been very helpful.

I find in the existence of the first satellites no cause for national alarm. In this respect I am disagreeing with many people who have been saying "Let's beat them"; "Let's put up a bigger satellite"; "Let's hit the moon with a rocket"; "Let's shoot something further"; and "Let's reorganize."

May I comment briefly on this reaction. First, in this present technological competition it is imperative we not be sidetracked from our prime security objectives by extraneous or irrelevant issues. The overriding objective of our present effort must be to maintain adequate military forces in being; adequate to deter military aggression or to defeat its purposes if our deterrent should fail.

After all, we are facing the very real threat of existing Communist armed forces. Russia alone has more than 170 divisions; her western satellites have another 70, and the Communist Far East around 200—a grand total of around 440 divisions. When we add to this the Communist-bloc combat-aircraft strength of more than 25,000, including the most advanced types, and her 500 submarines (the largest submarine fleet in the world), we see a very formidable immediate capability.

We must not be panicked or pushed into any sudden dispersion of effort which would scatter our talents and resources in an unprofitable or wasteful manner. We must not be talked into "hitting the moon with a rocket," for example, just to be first, unless by doing so we stand to gain something of real scientific or military significance.

When Sputnik II arrived, there was much clamor for drastic organizational shakeups and much talk about missile czars. Incidentally, there have been three men who successively occupied so-called missile czar positions in Defense. The first was Mr. K. T. Keller, who came in early in the Korean war buildup. He did a wonderful job of expediting important programs, but, by his own choice, he did it

with substantially no formal delegation of power. Moreover, he insisted on being relieved when he felt that he had finished his job. He was succeeded, in due course, first, by Dr. Eger Murphree, and, later, by Mr. William Holaday, both eminent in the field of science and technology. Both have done great jobs under a charter which, while somewhat strengthened, nevertheless continued to emphasize unseen rather than formal power. In order to make sure that Mr. Holaday's authority matches his great responsibility, the Secretary of Defense issued last week a new directive which made Mr. Holaday Director of Guided Missiles and placed him in solid charge of this program.

While organization is important, it has not, in my opinion, been a controlling factor in our long-range ballistic-missile programs. For some time, these have been given the highest national priority. They are progressing well and are substantially on schedule. As the President recently announced, our ballistic test missiles have made many successful flights to as much as 3,500 miles. Another series of rocket experiments in the Pacific achieved altitudes of over 2,500 miles. Unfortunately, some of our initial test-missile facilities received so much publicity that they created an unduly pessimistic picture in the public mind. We have a strong program that we can be proud of.

I would like to remark on Russian ballistic-missile claims and status. First, the fact that they claim a successful ICBM test does not necessarily mean they are anywhere near the time period when they will have operational units of intercontinental range. Their first very long-range missiles were undoubtedly test vehicles as were ours. Their ICBM announcement and their later references to it have been most carefully worded to create the impression they wanted to create, and to avoid disclosing anything about the range, accuracy, or stage of perfection of the weapon.

It takes us years to produce a new weapon system like the B–52 bomber. The ballistic-missile problem is even more difficult and takes even longer because of the many tough technical problems that have to be solved. The very size of the equipment and the test facilities adds to the difficulty. In our experience, there is a long time period between the first test firings and the final operational weapons. We have no reason to believe it is significantly different with them.

May I remark here on the frequently repeated view that the ICBM is the ultimate weapon. Whether it is ultimate no one knows. It certainly will not be a decisive weapon until a nation possesses proven operational missiles in considerable quantities. For many years to come, the manned nuclear bomber will be the primary deterrent weapon in our arsenal. This will probably also be true for the Soviets, despite their attempts to convince the world that manned aircraft are obsolete.

It is important that we undertake defense planning with two time periods in mind—first, today and the immediate future, and later that space era when long-range ballistic missiles are in operation, and other space projects of military importance are realities.

I believe there is no question that our near term position is sound. Our concern is with the speed and scope of the Soviet progress. We must be aware of the challenge this holds for us in the future period. We, too, must push ahead on a broad front, with due regard to scientific foundations for the long-range effort. As the President brought out so well in his Oklahoma City speech last week, this calls for a new look at our educational system, along with increased emphasis on basic research. It is in this long-pull sense that the Communist challenge must be taken most seriously.

It is interesting and revealing in this connection to study Mr. Khrushchev's recent tough and threatening remarks and relate them to Soviet actions. They have sought to capitalize on their recent missile achievements as a means of regaining some of the international prestige they lost when the rest of the world looked over the fence and saw what peace-loving communism did to the Hungarians and Poles.

At the same time Mr. Khrushchev is saying airplanes are obsolete museum pieces, that the U. S. S. R. wants peace and supports peaceful methods, and that the United States has blocked disarmament effort; Russia widely advertises her "intercontinental" ballistic missile, brags about her rockets, builds large numbers of modern combat aircraft, including intercontinental bombers, and then walks out on the United Nations disarmament talks.

All the while the Soviets are building and maintaining these huge forces, and in spite of the very considerable scientific progress they are making, her general economy remains far behind our own, as illustrated by the fact we produce twice the steel she produces, 14 times as many motor vehicles, more than 3 times as much electric power, and operate 3 times as much railroad mileage.

Perhaps the significant point here is that a nation with only a fraction of the industrial strength and resources of our own can, with its ruthless dictatorial system of government, make impressive progress along the lines in which they choose to concentrate their efforts. We can deplore the sacrifices their people are called on to make, but we must not fail to meet the competitive challenge. It will be costly and call for sacrifices on our part, in the form of personal effort on the part of some, and greater tax burdens than we like to bear on the part of all. If we are at times annoyed by the sacrifices we must make, we have grounds for hope that those under the Communist yoke will become outraged by theirs.

Our course seems very clear to me. We must do whatever it takes to meet this situation. We must recognize our community of interest with our free world friends and allies. We must, collectively with them, maintain adequate deterrent forces in instant readiness. We must plan our own programs for the long pull so that military security will not be undermined by economic insecurity. We must strengthen our foundations in the field of scientific and technical training and in basic research. And specifically we must broaden and deepen our programs for the exploration of outer space. We have the capacity to meet this challenge and still enjoy the highest standard of living that any people have ever enjoyed. My belief is that we would want to meet the challenge even if the standard of living had to suffer.

In closing, I would like to quote a few sentences from President Eisenhower's Oklahoma City speech which seem to me to epitomize our position:

"The goal we seek is peace with justice. This can come to our Nation only as it comes to all. The world's hope is that the Soviets will cooperate with all the rest of us in achieving this goal. Our defense effort, large as it is, goes only far enough to deter and defeat attack.

"We will never be an aggressor. We want adequate security. We want no more than adequacy. We will accept nothing less."

STEPS TAKEN TO ACCELERATE MILITARY PROGRAM

Mr. MAHON. Will you also insert in the record at this point so we will have it all in one place—and I am addressing this to you, Mr. Quarles—the specific things which have been done by the Department of Defense since October 1, or since the first sputnik, to accelerate or modify or speed up, whatever you may call it, our military program?

Mr. Quarles. I will do so, sir.

Mr. MAHON. I think that would be helpful.

(The information requested is as follows:)

STEPS TAKEN BY THE DEPARTMENT OF DEFENSE TO ACCELERATE OR MODIFY THE MILITARY PROGRAM SINCE OCTOBER 1, 1957

As a practical matter it is impossible to identify unequivocally those actions taken by the Department to accelerate the defense program as a result of the successful U. S. S. R. earth satellite and those actions which would have been taken to press forward with the defense program in the normal course of events. For example, the first action listed below, pertaining to the adjustment of the expenditure limitation on the military departments, would have been taken in any event. When it became clear that the Defense Department would not be able to bring its expenditures down to $38 billion for the current fiscal year without impairing vital elements of our military strength or engaging in unbusinesslike practices, the President promptly agreed to permit the Defense Department to exceed its budget estimate. Nevertheless, this action also gave the Defense Department the necessary flexibility to redirect resources where most needed.

The following are some of the more important actions taken during the period October 1 to mid-December 1957:

1. Department of Defense adjustment of expenditure limitations on the military departments.

2. Secretary of Defense McElroy requested the service Secretaries to notify him of any actions that might be necessary to expedite the ballistic-missile program. He also requested a weekly report on progress in the program.

3. Grant of an exception to the general overtime policy for the Vanguard project.

4. Removal of remaining overtime restrictions on the Air Force's Thor, Atlas, and Titan ballistic-missile programs.

5. Authorized Jupiter development schedule to be increased and authorized necessary overtime to meet program objectives.
6. Lockheed awarded contracts for continued development of the Polaris ballistic missile for the Navy.
7. Military departments relieved of the requirement of the Secretary of Defense's memorandum of August 17, 1957, which had reduced research and development program support.
8. Expedited conversion of two Army divisions under the pentomic concept.
9 Restatement of Department of Defense policy on paying contractors' bills as they fall due.
10. Army authorized to proceed with preparations for launching a scientific satellite by use of a modified Jupiter-C test vehicle. This supplements the Vanguard program in the IGY.
11. Establishment of the Office of Director of Guided Missiles within the Department of Defense. The Director will report directly to the Secretary of Defense on all matters relating to research, development, engineering, production and procurement of guided missiles.
12. The Department of Defense and the Atomic Energy Commission set up an integrated office to manage joint work on nuclear-powered aircraft and missiles.
13. Construction begun to convert Warren AFB, Wyo., to a missile site.
14. Authorization for peacetime missile firing at Cooke AFB, Calif., in order to accelerate operational readiness training.
15. Air Force directed to proceed with operational deployment of both Thor and Jupiter missile systems. Production for equipping of units authorized for Thor and Jupiter.
16. Transfer of the responsibility for the IOC phase of both ICBM's and IRBM's from ARDC to SAC.
17. Navy launches new scientific educational program to train 500 enlisted men annually.
18. Air Force to begin construction on four Bomarc missile sites.

Mr. MAHON. If there are no further questions of the Secretary and the Deputy, we will excuse them and we will ask the rest of you to stay a few minutes. Thank you very much. You have been very helpful.

THOR AND JUPITER COMPARED

Mr. Waggoner, will you identify yourself?

Mr. WAGGONER. I am Alvin Waggoner. I am the Executive Assistant to the Director of Guided Missiles of the Department of Defense.

Mr. MAHON. Mr. Scrivner had asked, I believe, that Mr. Holaday spell out the actual differences between the THOR and the JUPITER, and I believe Mr. Holaday had asked you, Mr. Waggoner, to go into that detail for the committee.

Will you proceed?

Mr. WAGGONER. All right, Mr. Chairman. In order to put this in the context, I would like to first show why the two missiles are considered to be similar.

(Discussion off the record.)

Mr. MAHON. I would say, Mr. Waggoner, that not all engineers can speak in such a way that the layman can fairly well understand it. I think your discussion has been most interesting and helpful.

Do you have anything to add to that, Mr. Holaday?

Mr. HOLADAY. No; he did a very nice job.

Mr. FLOOD. I wish you would check on this at a higher level

Mr. MAHON. There are no higher levels. You are talking to the czar.

MOBILITY OF IRBM

Mr. FLOOD. The Europeans are very much impressed by the potential of mobile or movable, whatever you call it, of this IRBM. All the European brass that I talked to are intensely interested in the movability or mobility of this weapon. I do not know what that means to you; it means nothing to me, but they are very much concerned about that factor for whatever it is worth.

(Discussion off the record.)

Mr. FLOOD. When you talk to them, you had better anticipate that because they talked me deaf, dumb, and blind; they do not know too much about it, maybe, but they talk about moving these IRBM's around.

Mr. MAHON. We will adjourn and reconvene tomorrow at 10 o'clock.

THURSDAY, NOVEMBER 21, 1957.

WITNESSES

DEPARTMENT OF DEFENSE

A. G. WAGGONER, EXECUTIVE ASSISTANT TO THE DIRECTOR OF GUIDED MISSILES

ARMY

MAJ. GEN. J. P. DALEY, OFFICE CHIEF, RESEARCH AND DEVELOPMENT, DIRECTOR OF SPECIAL WEAPONS

COL. J. R. DEANE, OFFICE CHIEF, RESEARCH AND DEVELOPMENT (GUIDED MISSILES)

LT. COL. WILLIAM R. PARR, DEPUTY CHIEF, GUIDED MISSILE BRANCH

NAVY

REAR ADM. W. F. RABORN, DIRECTOR, SPECIAL PROJECTS OFFICE

REAR ADM. J. E. CLARK, DIRECTOR OF GUIDED MISSILES DIVISION, OFFICE, CHIEF OF NAVAL OPERATIONS

EARTH SATELLITE PROGRAM

REAR ADM. R. BENNETT, CHIEF OF NAVAL RESEARCH, OFFICE OF NAVAL RESEARCH

REAR ADM. J. T. HAYWARD, ASSISTANT CHIEF OF NAVAL OPERATIONS (RESEARCH AND DEVELOPMENT)

DR. J. P. HAGEN, DIRECTOR, PROJECT VANGUARD, NAVAL RESEARCH LABORATORY

AIR FORCE

LT. GEN. C. S. IRVINE, DEPUTY CHIEF OF STAFF, MATERIEL, HEADQUARTERS, UNITED STATES AIR FORCE

MAJ. GEN. F. A. BOGART, DIRECTOR OF BUDGET, HEADQUARTERS, UNITED STATES AIR FORCE

BRIG. GEN. C. M. McCORKLE, ASSISTANT CHIEF OF STAFF, GUIDED MISSILES, HEADQUARTERS, UNITED STATES AIR FORCE

LT. COL. R. K. JACOBSON, AIR FORCE BALLISTIC MISSILES DIVISION, AIR RESEARCH AND DEVELOPMENT COMMAND

Mr. MAHON. The committee will be in order, please.

We are trying to find out where we are in our various ballistic missile programs, and then we want to know what we can do, conceivably, to expedite those programs. We want to know what you can do and what we could do to help expedite those programs.

We feel that we need to move faster than we had originally planned, and certainly as fast as we had originally planned.

In connection with these discussions, we want to know what funds available to you have been held in abeyance by the Budget or the Office of the Secretary of Defense, if any. We are not looking for a basis of criticism. We are looking for ways to free the people and free the money that is now available for the urgent programs with which we are confronted.

HEARING PROCEDURE

A witness can hardly speak a sentence without someone wanting to interrupt and ask for clarification. With the consent of the members of the committee, I am going to ask that each service take 30 minutes to brief us, and their sister services, on their problems, and then, after we have had this one hour and a half—30 minutes each—of testimony, we will ask questions. If agreeable to the committee, the chairman or any other member will not ask questions during the presentation.

Mr. SHEPPARD. We will not ask questions.

Mr. MAHON. We will not.

Mr. SHEPPARD. I think that is the only way to get any place, instead of spending a lot of unnecessary time, which I have no desire to do.

Mr. MAHON. Otherwise we will take all day with one service and not get the broader picture. Is that agreeable?

Mr. SHEPPARD. Let's go.

Mr. MAHON. Gentlemen, it is now 10 minutes after 10 approximately. In 30 minutes we will hear another witness. We will listen to General Irvine first.

Mr. WAGGONER. Mr. Chairman, we welcome this opportunity to give you the complete picture in this manner. We have modified the normal presentation order to some degree in order to give you a slightly better grouping of the missiles. The Air Force will lead off. General Irvine will introduce the Air Force. Following the Air Force, General Daley will present the Army program and following the Army program Admiral Raborn will present the Navy program.

Mr. MAHON. Usually we say Army, Navy, Air Force. Did you make this change for some reason?

Mr. WAGGONER. We made the change in order that the committee would have the complete ICBM picture first.

Mr. MAHON. All right.

Mr. WAGGONER. Then, in view of your interest in the JUPITER and the THOR missile, we thought that we would in essence present the THOR and JUPITER together, followed by the POLARIS, so that this is our reason for the switch. I would like to introduce General Irvine who will present the Air Force presentation.

Mr. MAHON. Very well.

AIR FORCE BALLISTIC MISSILE PROGRAMS

General IRVINE. Mr. Chairman, committee members.

Mr. MAHON. We are glad to have you, General.

General IRVINE. This is a real privilege to take a few minutes to tell you about our programs, and so I intend to just mention briefly what our programs are and then have Colonel Jacobson give you a capsule version of what the committee saw on the west coast.

ATLAS

To begin with, our ATLAS missile at Convair, San Diego, is our oldest program. It has been going for many years. It is now in the test stage and as usual in the missile business, we have had some troubles. It is our present plan to have the first squadron of these missiles operational in fiscal year 1959.

(Discussion off the record.)

TITAN

In the other ICBM area, the TITAN, built by Martin at Denver, follows a little less than a year behind the ATLAS. It, like most later developments, is smaller, better, and will be a little more accurate.

It is important to us because we feel it is one of the initial building blocks for the eventual space vehicle program. It is of that type.

THOR

Our closest missile is the THOR. Now we feel in the case of the THOR that we can produce and deploy the first operational squadron in calendar year 1958.

With the later squadrons of the THOR, we will have a better range capability as the natural outgrowth of the model improvement program. This program that we proposed is ambitious. We think it is entirely feasible. We feel strongly about the capability of the THOR machine because we have developed it in the same manner we have the B–52 and other weapon systems, where we are creating the ground environment, the ground support equipment, the training of the people, these programs coming along not in series but in parallel.

ADDITIONAL FUNDS REQUIRED

Now, to do some of the programs that have been proposed will require additional money in 1958. We feel strongly we should have a supplement for 1958 to expedite these programs, to get them in gear as quickly as possible.

I would like to point out in the case of the THOR, that for a long time in the mind of this old production man, there was a feeling we ought to go for additional squadrons of THORS and continue to improve them as we go along.

I would like to say, in asking for a supplement in 1958 to get this program on the road, this money is required not only to produce a missile, which in the mind of an old production man is the easy job. The fact is you can build 20 airplanes a month and you can build 100 THORS easily. The problem is really the ground support and test equipment—the ground environment.

I think it is important to note here that in talking about a package of additional squadrons, it is going to cost less to build them on an expedited basis than if we string it out on a long term and have a real first-class production job.

I would like to introduce Colonel Jacobson, who will give you a capsule version of what was presented to you on the west coast.

Mr. MAHON. Not all of the members of the committee were on the west coast.

Colonel JACOBSON. That is right, sir. What I intend to do this morning in the brief time we have is to summarize what we had on the west coast, to give you a brief summary from charts, and so forth. Obviously in about 25 minutes we will not be able to cover it in detail. I will cover the major points of the program that we are on now and later, if there are any questions, they can be taken up. I propose to start with the THOR, IRBM and to show to the committee the planning that the Air Force has for THOR. This is the production base that was established as an approved development plan in May.

(Discussion off the record.)

THOR TESTING

Colonel JACOBSON. A great deal of testing has already gone into the THOR program, so far as its guidance systems and nose cones are concerned. Guidance has been tested on sled tracks, centifruges. The Air Force has absolute assurance that the guidance system will do better than the requirements established for it and we are using production line guidance systems in this testing. In the nose cone area we have been through nose cone drop test programs, to go through the very difficult transsonic regions on the reentry. We have established a reentry test vehicle which allows for testing at IRBM speeds, heat rates, and so forth. We completed that program almost a year ago, with the reentry test vehicle program including 17 completely successful reentry tests. That is basic information on the THOR program.

(Discussion off the record.)

Colonel JACOBSON. Gentlemen, that is just under our time and a very brief rundown, Mr. Chairman, of what we presented on the coast. In the few moments we have left, is there any other area you would like me to cover?

FUNDING OF AIR FORCE MISSILE PROGRAMS

Mr. MAHON. Can you cost these programs, say, for 3 years on the THOR, the TITAN, and the ATLAS? Are there any cost figures in a very broad sense?

General IRVINE. General Bogart has our cost figures.

General BOGART. I have only the cost figures of the currently approved programs, of course. We have programed at the present time for both the ICBM and the IRBM programs, as of October 31, $2,703.9 million. That is the program.

Mr. MAHON. For what?

General BOGART. For the ATLAS, TITAN, and THOR.

Mr. MAHON. For fiscal 1959?

General BOGART. No; fiscal 1955 through fiscal 1958.

Mr. MAHON. I am not interested in what we have spent. I am interested in from here on.

General BOGART. The program that we have at the present time, sir, is a total program of approximately $1.1 billion for fiscal year 1959.

Mr. MAHON. Is that an appropriation program or a spending program?

General BOGART. That is an appropriation program, sir.

Mr. MAHON. That is the presputnik program?

General BOGART. Yes, sir. We do have 2 or 3 proposals which have been made to the Department of Defense. I cannot tell you which of these is being accepted or which one will be.

Mr. MAHON. Give us the cost generally of these expedited programs.

General BOGART. We have expedited programs, sir, for the 3 missiles, which will run from $300 to $500 million in addition for fiscal year 1959, and, depending on which schedule is accepted, we would require from $100 to $200 million augmentation in fiscal year 1958, just for these particular programs.

Mr. MAHON. What would it be like in the 1960 program?

General BOGART. The 1960 program, sir, again depending——

Mr. MAHON. Well, the maximum program, or the mid, or the low.

General BOGART. We have not hit a maximum program at all, sir, because, as Colonel Jacobson pointed out, on a production basis you can go completely out of sight on these missiles. The limiting factor is construction capability and training capability, and our programs would run about a billion and a half a year to $1.8 billion a year, through 1961. Then they would taper back down. That is after we hit maximum construction and production requirements.

Mr. MAHON. General Irvine?

General IRVINE. In the case of the THOR, for example, looking at it now, we presently have, in fiscal 1958, $147 million applied specifically to this program. Remember, in the case of the THOR it has been a relatively inexpensive program as far as the Air Force is concerned, because it is taking the engines and guidance systems from the intercontinental programs.

This addition to the 147, to go toward this ——— squadron plan that I spoke of as my own personal feeling of what we might do, would require about double that sum, another $150 million in fiscal 1958; in fiscal 1959 to go to a total of about $400 million.

Mr. WIGGLESWORTH. What would this $100 million to $200 million you are talking about in terms of 1958 be used for?

Colonel JACOBSON. The figures that General Irvine gave, sir, would move ahead, the whole of the IRBM effort for a ——— capability in the field, to ——— and would start the acceleration from that which is currently planned. You gain, roughly, a year in time and start the base for quadrupling the IOC force.

PUTTING MISSILES INTO PRODUCTION

Mr. WIGGLESWORTH. That assumes you go from the development to the operational phase forthwith, does it not?

General IRVINE. That is right.

Colonel JACOBSON. It assumes you say, "Yes; we are sure it will work." You want to remember that prior to the time we go to operations we have quite a period of time left for testing. We feel confident in every component of the system.

Mr. WIGGLESWORTH. You go into mass production as distinguished from research and development.

Colonel JACOBSON. The items coming off are from production-line tooling, production-line procedures, production-line acceptance, production-line testing. All of these are being accomplished. What it would require is that you turn out more of the same thing.

Mr. WIGGLESWORTH. You go from the development phase to the operational. That is what I mean.

Mr. MAHON. Do you think it is safe to go, at this time, into the production phase as suggested there, General?

General IRVINE. Mr. Chairman, I would like to go back to World War II, when I used to carry a briefcase for Arnold and Knudsen, when I was given the job of determining the requirements to build 500 4-engine bombers a month. There it was a real gamble. We were gambling on the capability of a great company, the Boeing Aircraft Co., to produce the things they said they could make. We did the same thing with Convair, the same thing with Douglas. We are talking about giving the same management that did the job for us in World War II a job to do which is easier and safer, engineering and productionwise, than our B–17 or B–29 programs.

Mr. MAHON. Do you mean to say, then, that you believe that we can safely proceed with producing the end item?

General IRVINE. Yes, sir.

Mr. MAHON. And you advocate and recommend that?

General IRVINE. I do.

Mr. MAHON. All right. Off the record.

ARMY JUPITER PROGRAM

Mr. MAHON. Back on the record.

Mr. WAGGONER. Our next program is the Army JUPITER program. General Daley will present the program.

General DALEY. Mr. Chairman and gentlemen, I would like to show the first chart. This is a review of JUPITER firings. The first JUPITER was fired on March 1, 1957.

(Discussion off the record.)

General DALEY. On the 31st of May we fired a JUPITER to a range of 1,400 statute miles completely successfully. On the 26th of August, we fired another successful JUPITER to a range of 1,465 miles, again a successful flight. On the 23d of October, we fired a JUPITER.

(Discussion off the record.)

General DALEY. A completely successful flight. We have the next JUPITER scheduled for flight next week, again a guided flight.

The next chart here shows the JUPITER firing plan. I indicate on this chart three types of missiles.

Mr. MAHON. Could that possibly mean a firing next week?

General DALEY. Yes, sir.

Mr. MAHON. Tuesday?

General DALEY. Yes, sir. On this chart we show JUPITER–A missiles, JUPITER–C missiles, and JUPITER missiles. The JUPITER–A is a REDSTONE missile which is carrying components to assist in finding how these components of JUPITER work in a firing environment. The JUPITER–C is a composite reentry test vehicle. It actually is a REDSTONE booster.

TEST OF JUPITER NOSE CONE

We use this to fire a scaled-down model of the nose cone we expect to use on the JUPITER.

(Discussion off the record.)

General DALEY. We fired that in August, and the second one we tried and, with the cooperation of the Navy, recovered the nose cone, brought it back, and we are satisfied that that solved our reentry problem with the JUPITER missile.

We have since verified this on the last firing of the JUPITER. We received data to impact which would indicate that the nose cone did protect the contents.

JUPITER TEST SCHEDULE

This particular chart, one thing I would like to emphasize, it is essentially the same schedule we have had for 2 years. Two minor changes. One, we have added a few JUPITER missiles to it, hence the difference in the A, B, and 3–A. Those missiles were inserted after the firing program began. Similarly in our original schedule we had a large number of blue squares.

(Discussion off the record.)

General DALEY. That is the one that went three-thousand-three-hundred-and-some miles. Then we fired two others.

Since we have considered we are successful in this, we have pulled those missiles out of the firing program. Aside from that, this is essentially the same firing program. The noticeable thing is the red dots we added where missiles have been fired. It is right on the schedule we started with.

GUIDANCE SYSTEM

In summary, as far as these particular items go, we consider that the JUPITER is on schedule. We have a guidance system that has been flown. It is essentially an outgrowth of the REDSTONE guidance system which we have used over a very large number of firings, some of which you see on this chart. We feel the nose cone problem has been solved.

JUPITER CONTRACTORS

We have confidence in our contractors. Our ABMA has as principal contractors Chrysler, Ford Instrument Co., North American Aviation, of course, for engines. The same team has carried the REDSTONE missile through into production. We feel they can carry the JUPITER through into production.

MOBILITY OF JUPITER

Another feature of the JUPITER system, while the JUPITER system can be applied to a fixed base of a semifixed base, the JUPITER was originally designed to be a mobile system. It is readily adaptable to mobility. At this time, Mr. Chairman, I would like to show a 9½-minute film.

Mr. MAHON. Very well.

(At this point a film was shown.)

PRODUCTION CAPABILITY

General DALEY. Mr. Chairman, I would briefly like to run through production capability with the JUPITER system. This first chart shows the production capabilities to meet the original Air Force initial operational capability.

(Discussion off the record.)

This production was based simply to meet the requirements of the Air Force. We have studied several other possible programs.

This next one shows a capability of going up to ——— missiles per month by ———. These are missiles for use in the field, operational missiles as distinguished from research and development missiles.

A third possible production rate is this one in which we would tool up Ford Instrument Co. additionally and build up to a rate of ———.

The important thing in any of these systems or in any of these production rates would be a decision to produce now. Actually from now on in my opinion each month that you delay a decision to produce you delay the initial availability of missiles.

Mr. WIGGLESWORTH. Those missiles are on the basis of existing facilities?

General DALEY. Those figures are based on the facilities at ABMA, using the existing plant at Chrysler that Chrysler has in Detroit, but tooling that plant up.

I would point out that the Chrysler plant has had extensive experience in producing the REDSTONE missile, a similar missile, and that Chrysler actually maintains an engineering crew at the Army Ballistic Missile Agency. So they are intimately familiar with these processes.

FUNDING OF JUPITER

To give you figures on one of the questions asked, which was a question about money, as to what the money status is, as far as the JUPITER program is concerned we were given $35 million of emergency funds from the Department of Defense to carry the program to November 1. Subsequent to that we submitted for the R. & D. program our requirements through July 1. We did it in two separate installments. One was for $58 million to January 1 and another for $36 million additional to July 1. This was to carry through the research and development program.

The Department of Defense has apparently given us the procurement and production money and they have authorized us to take $13.8 million of research and development funds which were held in reserve from the Army's original $372 million appropriation in research and development and authorized us to apply that to meet the requirements through January 1.

Mr. SIKES. Does that mean you have to take money from other R. & D. projects and apply it to JUPITER?

General DALEY. Yes.

Mr. FLOOD. What do you mean by apparently? Don't you know? If you do not know, who does?

Mr. SIKES. You say you apparently have been given the money; what does that mean?

Mr. FLOOD. You have it or you have not.

General DALEY. We have the money, sir. I do not know until I see the final fiscal transactions that this has literally been above the Department of the Army's ceiling. That is with respect to procurement and production funds. We have every indication that procurement and production funds will be above our present ceiling. We were told to take the research and development money from the initial $372 million that we had.

Mr. MAHON. Proceed, General.

General DALEY. Off the record.

You asked, Mr. Chairman, that we show certain slides, and so forth, of the Soviet missile program. I am prepared to show those at this time if you desire.

SUMMARY OF JUPITER PROGRAM

Mr. MAHON. I think, General, you would want to give us anything further about the JUPITER versus THOR problem now.

General DALEY. Yes, sir. I would like to more or less summarize what I have said and also try to answer some of the specific questions you asked. You asked what can we do to hurry up the program. Our research and development program is on schedule. The one thing that would hurry up the program in the sense of providing deployable missiles and deployable units would be a decision to produce. That is the essential ingredient.

I have covered the question of funds.

Another factor that must be considered in the question of production is, taking the Air Force presentation and our own presentation, the obvious way to get missiles quickly is to put both in production.

As far as the JUPITER program problem is concerned, I would make these points. The JUPITER is on schedule, we have used guidance, we have based it on a successful ballistic missile program and are using as our production people the people who are producing REDSTONE missile which is a big ballistic missile of the same general type.

We have satisfied ourselves that we have solved the nose-cone reentry problem. The JUPITER system is very adaptable to mobile concept which would be very important if you intend to deploy these things hither and yon because you are not faced with the lead time in concrete.

Lastly, the Army does have one other capability and that is the actual fact that we have missilemen in training on REDSTONE battalions whose retraining would not take significant lengths of time. These are actual units which are to be deployed. A second one has been organized at Fort Sill now. These are an existing personnel asset.

DEPLOYMENT OF JUPITER

Mr. SIKES. If you were told to go ahead with your program at full speed—I am speaking now of placing units in Europe on site—how soon could you be deployed in Europe?

General DALEY. Off the record.

Mr. FORD. Does this schedule visualize any reduction in the capability of missiles?

General DALEY. Reduction in the capability of the missile. No, sir. It visualizes in the first few missiles that we will go into production now using the designs which we have already firmed for our final missiles. It does mean it is very probable that the first few missiles of the line will have to be modified. I think this is true of anybody's missile.

Mr. MAHON. You have done a good quick job for us.

Mr. FLOOD. May I ask this question?

Mr. MAHON. We will have a question period.

Mr. FLOOD. I have heard about 20 so far. I will wait. I will be here a long time I hope.

Mr. MAHON. With the forbearance of the committee, if you are right ready to show us the ballistic missile program of Soviet Russia vis-a-vis the United States on those charts, you can do it.

These are agreed intelligence figures, as I understand, Army, Navy, and Air Force, is that right?

General DALEY. Off the record.

(Discussion off the record.)

Mr. MAHON. Are we ahead or are we behind the Russians in the ballistic missile field? That is what we are talking about. This bears on that point.

Colonel PARR. The spread of range figures on the side here indicates the various missile systems which the Soviets have under development.

(Discussion off the record.)

Mr. MAHON. Why is the Pentagon telling Congress and the country that we lead the Russians in the IRBM? Why mislead the Congress and the country if this chart is right?

General IRVINE. In an analysis of any intelligence data you can get as many different opinions as you have people. The Air Force's analysis of what the MIG 15's could do turned out to be so close you could not see the lines on the chart. So I submit, military people who have spent their lives in this sort of thing—the Army, the Navy and the Air Force—should be the best military analysts.

Mr. MAHON. Yes.

Mr. FLOOD. Except may I say this: If you are talking about an IRBM that the Air Force means, whenever you say IRBM to me all I think about is 1,500 miles. That is all we have been taught here by you, 1,500 miles. That is what we mean by an IRBM. Now, if that is what you mean, then you are probably right. But when you say IRBM to somebody in Europe, the Germans, the French, the British, the Spanish, or the Russians' general staff, our airbases and all of our installations—Navy, Air, and Army—Continental Europe and the rest of the world, it means anything under 1,000 miles. I think the Russians are operational in that now.

Mr. WAGGONER. Our next program will be presented by Admiral Raborn.

THE POLARIS MISSILE

Admiral RABORN. It is a distinct pleasure to give you a short résumé of our program, sir, and I would like to say that I will not bore you with too many technical details. I would like to give you a feeling of the progress that we have made since the last time we had the honor to appear before your committee. So I would like to show you with this slide what my job is.

The job is to build a POLARIS missile and put it in a submarine for use in the ships at sea. I have taken the liberty to show all of the missiles in the national program here, the ballistic missiles, because I would like to compare the size of the POLARIS which is the only solid-propellent ballistic missile in the national program, with the other missiles.

This [indicating] is the missile itself.

(Discussion off the record.)

Admiral RABORN. The job that the Chief of Naval Operations gave me 2 years ago was to come up with a missile in a submarine, a complete-package job.

The operational objectives to accomplish these goals are shown here on this slide.

NAVIGATIONAL TEST SHIP

We have a navigational test ship. We have a missile-firing test ship. The lessons we have learned will be transferred into the nuclear-powered submarines.

Here on this slide is the submarine. The submarine is built on the *Albacore* shape, which, as you know, is a very maneuverable and speedy craft indeed.

The navigational test ship shown on this slide has been at sea for almost a year. It was commissioned the 3d of last December. The navigational equipment aboard that ship has proven most satisfactory to us. In fact, I am very happy to say that we are at least several years ahead of ourselves in the development of precise and accurate navigation at sea.

Now, the second test ship is a seagoing firing test ship. It is now in Norfolk. We have accelerated this program by several months. It is undergoing conversion. It will have the navigational test equipment which you saw on the first ship plus the necessary launching and handling gear and associated fire-control systems.

(Discussion off the record.)

PROGRESS REPORT ON POLARIS

Admiral RABORN. I would like to give you just a short progress report on the missile. We have been most successful to date in solving the basic problems which go with a ballistic missile, and particularly one of a solid-propellent type. I can say to you with all sincerity that we have solved all of the basic problems and from now on they are principally engineering refinements. We are very happy about this.

REENTRY TESTS

The reentry body is shown here. I have just summarized the successes that we have had to date.

I would like to say further that these reentry body tests are done with a test vehicle developed by the Air Force

Here is another example of interservice cooperation. We purchased those from Lockheed and saved considerable money in not having to develop a reentry test vehicle.

GUIDANCE

Now, the guidance package. Here again we are taking full advantage of the ground that has been plowed before. The Navy about 8 years ago started, through Dr. Draper of MIT, on some advanced gyro work. The Navy got a little poor and could not afford this—that is what is told me—and the Air Force picked up the tab, and we are now reaping the benefits of the fine work done at MIT.

(Discussion off the record.)

Admiral RAYBORN. Now, that concludes my presentation.

Mr. WAGGONER. Admiral Raborn's presentation concludes the schedule that we had set up. We certainly appreciate your assistance

in allowing us to get through this and give you more or less a capsule treatment here. We are all available for questions by either you, Mr. Chairman, or the committee members.

Mr. MAHON. Gentlemen, I must say that I have been very gratified with this presentation. I have been encouraged. It is very pleasing to see the confident climate that exists among you people who have such important responsibilities in this highly critical field of ballistic missiles.

I thank you very much. We will stand adjourned until 1:45 o'clock.

JUPITER FUNDING

Mr. MAHON. Gentlemen, at the moment I would like to take a little time to explore the fiscal picture with respect to the ballistic-missile program.

I would first like to ask the Army if you can brief the committee as to your situation from the standpoint of money.

There was a special arrangement with respect to the JUPITER whereby you would get certain funds from the emergency fund of the Secretary of Defense. Has any of that money been withheld? Has there been any problem along that line?

General DALEY. Sir, the funding for the JUPITER for fiscal year 1958 falls into three separate groups. In the first place, the original decision was to continue the JUPITER and to fund it through the 30th of November of this year, and to provide additional resources, if it was desired to continue the program. That $35 million was provided to the Army from Department of Defense resources, I believe, emergency funds.

That gave us the money to continue the program through the 30th of November. The reason that we could run the program on this kind of money was an intentional deferment of long-term procurement until some other decision was reached.

As a result of the Holaday-Schriever-Medaris meetings in September and early October it was decided to carry both programs along, and to make a reanalysis some time around the 1st of January. The Army, on this basis, requested from the Department of Defense the money in two separate groups. That money which we would need for the period November–December, or would need to have prior to January 1—this was $58 million, of which approximately, well, exactly $13.8 of it was research and development funds; the rest was production and procurement money.

The Department of Defense authorized us to reprogram the production and procurement funds from funds which we had on hand, and it is the Army's understanding that that money will be made available to the Army above the approved Army fiscal plan for the production and procurement money.

The actual financial transaction on this, I believe, is supposed to take place on or around December 1.

With respect to the $13.8 million of research and development funds, we were told to take that. We had originally appropriated by Congress $372 million of which, first, $355 million was made available to us; then another $1 million was made available for a free radical program, leaving $16 million which was in, or held by DOD. The Department of Defense told us to use $13.8 million of that $16 million to meet the R. and D. requirements.

With respect to the period beyond the 1st of January, we need——

Mr. WIGGLESWORTH. What period is that?

General DALEY. The period of January 1, to July 1, speaking only of the R. and D. program, but speaking both of R. and D. and procurement and production funds, we need an additional $36 million.

This actually breaks down. The larger proportion is production and procurement money; $9 million or $9 million-plus is research and development money. This is a requirement which we indicated we had to have by January 1. No action has been taken on it, necessarily.

These are all research and development funds; I mean for the research and development program. In addition to that, if we were to go into any production program there would be additional money needed. Speaking specifically of the Air Force initial operational capability, this money in fiscal year 1958 would have amounted to, or would amount to about $49 million, which we would also need available on January 1, 1958.

I believe that summarizes the fiscal picture as far as the programs go at this time, sir.

WITHHOLDING OF FUNDS IN ARMY MISSILE PROGRAM

Mr. MAHON. What funds, if any, have been withheld from the Army in this general field as a result of the determination of the Government to try to stay within the range of about $38 billion for Defense Department expenditures for fiscal 1958?

General DALEY. This, sir, is a question I cannot completely answer. The funds that have been withheld is the difference between $356 million as I explained and $372 million in the research and development. Those funds have been withheld, but I certainly am not competent to state the reason.

Mr. MAHON. They were withheld from your authority to obligate or expend?

General DALEY. That is right. It is from those funds that the research and development money for the period prior to January 1, the $13.8, is supposed to come.

Mr. MAHON. In other words, the withheld funds are no longer being withheld but they are being assigned to this JUPITER program?

General DALEY. That is correct.

Mr. MAHON. They otherwise would have been assigned to what programs?

General DALEY. Had they been given to us they would have been assigned to other Army research and development programs. There might be some money that might have been applied to Hawk, some to Lacrosse, some to Hercules improvement program, some money that we might have put into modernization at White Sands Proving Ground. There is a considerable list.

Mr. MAHON. There is a wide area where you might have used some some of the money?

General DALEY. Yes.

Mr. WIGGLESWORTH. If I understand you correctly, your answer, insofar as the ballistic-missile field is concerned, is that nothing has been withheld; is that correct?

General DALEY. As far as the ballistic-missile field is concerned we have all the money to date—we have all the money we need for the research and development program and none has been withheld.

Mr. MAHON. And you never had any in the first place for production?

General DALEY. We never had any in the first place for production, no, sir.

Mr. MAHON. I would like to go to another subject.

Mr. RILEY. Mr. Chairman, may I ask a question right there, please?

Mr. MAHON. Mr. Riley.

FUNDS AVAILABLE FOR JUPITER IN FISCAL YEAR 1958

Mr. RILEY. When was this $35 million from the emergency fund made available to you?

General DALEY. The $35 million from the emergency fund was made available to us in September of this year, sir.

Mr. RILEY. Did you have sufficient money to carry out the program without delays during July, August, and September?

General DALEY. We did but we were getting worried.

Mr. MAHON. Colonel, could you supplement this information?

Colonel DEANE. I am Colonel Deane of the Office of Research and Development. I was mentioning to General Daley that we did not budget for the JUPITER in fiscal year 1958, so no money was withheld from our budget because there was no money in our budget.

FUNDING OF POLARIS

Mr. MAHON. All right. Give me the same information for the Navy, please, with respect to your POLARIS program and other programs.

Admiral RABORN. Mr. Chairman, Congress granted us $179 million in fiscal 1958—$179,127,000. All of this money has been made available to us. We have not had any money withheld, and I believe that we have had no impediment to our technical progress due to lack of funds.

Mr. MAHON. Is there a budget officer for the Army and Navy present?

Admiral RABORN. I am my own budget officer.

Mr. MAHON. We are speaking here for the ballistic missile program.

Admiral RABORN. Yes, sir.

Mr. MAHON. You cannot answer for the entire Army and Navy?

Admiral CLARK. The same is true for the Navy missile.

Mr. MAHON. For the whole Navy program?

Admiral CLARK. That is correct. Nothing has been withheld.

WITHHOLDING OF FUNDS TO REMAIN WITHIN $38 BILLION LIMITATION

Mr. MAHON. I wish each service would supply the committee with a statement of all funds withheld in connection with the attempt of the Government to stay within the $38 billion level.

Admiral CLARK. I can supply the statement for the Navy now, Mr. Chairman. Our missiles across the board——

Mr. MAHON. I am not talking about missiles only. I am talking about the whole Navy.

Admiral CLARK. I beg your pardon, sir.

(The information subsequently supplied may be found on p. 123.)

Mr. MAHON. Unless there are further questions, at this point I would like for the Air Force to give us a picture of the funds situation there. You can have General Bogart do it or you may do it, General Irvine.

FISCAL RESTRICTIONS ON AIR FORCE PROGRAMS

General IRVINE. I would like to cover it from a programing and production viewpoint and let General Bogart check me on actual dollars. To the best of my knowledge we have had little or no limitation on research and development programs by fund limitation directly. We have been held down in our programs leading toward the implementation of operational squadrons by being held down in our ——— missile production in a plant that was set up to build at a faster rate on a one-shift basis. We have been stopped from buying long lead time items leading toward the same purpose.

Mr. WIGGLESWORTH. That is the August directive you refer to.

General IRVINE. Yes, sir. That, in effect, denied us the funds. It denied us the opportunity to spend the money. This was an administrative programing limitation.

Mr. MAHON. You had the funds and you had the program requirements for them, but you were deterred, for budgetary reasons or otherwise, from obligating and expending these particular funds?

General IRVINE. I will not try to analyze just what the reason was but we had three limitations, overtime expenditures, production rate per month, and this is the difference you saw in the chart, and the time at which you could have operational units in the field.

Mr. MAHON. In other words, we have already had some slippage from your original program.

General IRVINE. Yes, sir.

Mr. MAHON. General Bogart, would you give us a little clearer statement from the standpoint of figures?

FUND STATUS OF BALLISTIC MISSILES PROGRAM

General BOGART. Yes, sir. Mr. Chairman, as far as our overall funding picture for the ballistic missile program, including all three of our ballistic missiles, we have up to the present time a total program of $2,703.9 million, of which $2,358.8 million has been apportioned and allocated.

We have a very small amount of funds for the fiscal year 1957 program which has not yet been apportioned, and about $50 million of the 1958 program—I am sorry—it is about $350 million of the 1958 program which has not yet been apportioned or allocated, but that is because we have not yet asked for it. We have no hold on the funds for the program. The only holds we do have are the program-type holds, which General Irvine explained. In other words, we have not asked for all of our money yet, but we do have enough money to go right ahead as soon as we have a release from the hold on the THOR program. We are fully funded to go right ahead with it.

Mr. MAHON. Was this hold made in about August?

RESTRICTION ON PRODUCTION OF THOR

General BOGART. Yes, sir. This was an August order that told us to not go beyond ——— a certain monthly rate on the THOR program. Our schedule would have gotten us up to ——— a month.

Mr. MAHON. How much money was involved in that August decision or directive?

General BOGART. I cannot tell you, sir. We already had funds apportioned up to about $98 million, against $148 million programed for the year. I cannot tell you how much was affected because we had no withdrawal of funds or anything like that. This was strictly a program hold.

Mr. MAHON. It was a question of holding down the program to wait and see further as to what decision would come.

General BOGART. Yes, sir.

General IRVINE. We actually built ahead of our requirements. We have the material on the back burner that we are not using that is in inventory at the moment.

Mr. FLOOD. May I ask a question on what you are talking about?

Mr. MAHON. Yes.

Mr. FLOOD. If you have something right on that I would rather you finish.

Mr. MAHON. I want to complete this point.

Mr. FLOOD. All right.

Mr. MAHON. I am not trying to be critical of anybody. I realize that the problems of management are very great. My only point is that it is my understanding that after we had provided the funds for a program which you presented, you were told not to proceed full speed with that program, and that was done in August. You acted in obedience to that decision?

General IRVINE. That is correct.

Mr. WIGGLESWORTH. That does not affect the research and development end of the program at all, as I understand it.

General IRVINE. Not materially. There may be some problem involved but this is not too serious.

General BOGART. This is a development program.

EFFECT OF FUND RESTRICTIONS ON MISSILE OPERATIONAL CAPABILITIES

Mr. MAHON. Did it or did it not affect the initial operational capability with these missiles?

General IRVINE. Yes.

Mr. SHEPPARD. It certainly had to. It reduced the contemplated production figure they had.

Mr. MAHON. I believe some reference has been made to this. To what extent did this happen? What is the extent of slippage to date?

Colonel JACOBSON. We estimated and have presented to this committee, Mr. Chairman, to the effect that if we receive a go-ahead as of January 1, which is assumed, the time lost in the program would be 6 months; the slippage in the first IOC would be 6 months, going back to the same rated program that we had before.

Mr. MAHON. I see.

Mr. WIGGLESWORTH. Why should that follow from a 4 months' delay?

Colonel JACOBSON. It holds down a lot of things, sir. The 4 months—this is not just wait for 4 months, where you are. It actually cut us back below the point we had reached in production capability. It allowed no new starts and no procurement of equipment against the IOC. It takes time to accelerate the plant, sir.

It takes time, it takes people to accelerate back up to where you are, sir.

General IRVINE. This caught us right in the middle of the acceleration, Mr. Congressman.

Mr. MAHON. If you can supply any further information at this point, do so for the record.

(No further information was supplied.)

Mr. MAHON. I shall ask no more questions on that point. Mr. Sheppard?

REDUCTION OF MISSLE-PRODUCTION RATES

Mr. SHEPPARD. Your testimony heretofore was that you had projected so many missiles as a production requirement. At the time you were up here asking for your appropriations you made your presentation upon a projection of how many missiles?

General IRVINE. Off the record.

Mr. SHEPPARD. You have answered that. The minute the order came out to confine yourself to the 1957 spending level, or words to that effect, you were reduced.

General IRVINE. Yes, sir.

Mr. SHEPPARD. How much were you reduced in other categories? You stated you had so many ———. What reduction did you make in the other categories?

General IRVINE. Off the record.

Mr. SHEPPARD. Then in answer to the chairman's question, whether you agree or whether you do not, your program was affected as really projected by the difference between the missiles that you were to make and the missiles you were permitted to make.

General IRVINE. That is right.

Mr. SHEPPARD. So your program was retarded, was it not? Stopped, call it whatever you may, you use your own terminology. Something happened to it. You define what it was.

General IRVINE. My statement was we were not financially limited. This was a program change. This, in effect, reduced the number.

Mr. SHEPPARD. I do not want to become argumentative. I do not like to pursue that kind of a course. Your presentation to the Congress was that you wanted money for so many missiles.

General IRVINE. That is right.

Mr. SHEPPARD. The Congress appropriated those funds.

General IRVINE. That is right.

EFFECTS OF WITHHOLDING OF FUNDS ON AIR FORCE MISSILE PROGRAMS

Mr. SHEPPARD. After the Congress had appropriated those funds, an order was issued that restricted the numerical production of what you originally projected?

General IRVINE. That is right.

Mr. SHEPPARD. What did that do to your program? You use your own terminology. I want an answer of some kind.

General IRVINE. Yes, sir. It affected our research and development program to some degree because part of these missiles were for research and development. It seriously delayed the activation date of operational squadrons.

Mr. SHEPPARD. Your research and development program, with due respect to the inquiry from my friend, Mr. Wigglesworth, and your response to him, was retarded to that degree. Further than that, what effect did it have upon your further research and development in those items that are produced and contemplated for production and operational purposes?

General IRVINE. To give you a precise answer on that would take somebody like General Schriever, who is closely connected with that, or Colonel Jacobson, his assistant.

Mr. SHEPPARD. I am not trying to embarrass you by asking a question that does not fall within your category.

Colonel JACOBSON. The limitation, sir, by programs —actually, the rate authorized us for both the ATLAS and the TITAN is adequate to carry out the R. and D. program. The restrictions are on the rate of buildup. Beyond that point, in the ICBM case, there has been no restriction on the date at which you get to the first capability. This has not been retarded in any fashion, sir.

Mr. SHEPPARD. In other words, then, insofar as available funds are concerned to put the ——— missile limitation that you have opera-

Colonel JACOBSON. Perhaps I am not being clear, sir. I talked about the case of the ICBM, ATLAS and TITAN.

Mr. SHEPPARD. I am covering the whole program so far as it regards missiles.

I want this clear in my mind. What your interpretation is may be one thing. I have a right to mine. You try to answer my question.

Colonel JACOBSON. I am trying to differentiate between the ICBM and IRBM case. In the IRBM case, the restriction has curtailed the whole program. It has delayed the initiation of the operational capability. It has cut back the entire IRBM program for the Air Force. There has been no restriction of the same type placed on the ICBM program. In the ICBM program there was a revision downward in the size of the force structure, but no change in the initial dates. The initial dates have held. The rate of buildup beyond that point has changed. Does that answer your question?

PROGRESS PAYMENTS

Mr. SHEPPARD. Yes. That answers the question very satisfactorily. What, if anything, have you had in orders or have you assumed within yourselves insofar as making progress payments are concerned?

Colonel JACOBSON. I think General Bogart or General Irvine should answer that, sir.

General IRVINE. In regard to progress payments, we have sometimes since, on fixed-price contracts, reduced the progress payments from 75 to 70 percent.

Mr. SHEPPARD. What necessitated that approach to the problem?

General IRVINE. This is an across-the-board Department of Defense directive, as I understand it. In the case of the cost-plus-fixed-fee type contracts—and the majority of this type of program is covered by that type of contract—a reduction was made where in the past we have normally paid 90 to 100 percent of the work or effort accomplished on this type of contract. This was recently changed to

80 percent, and this, Air Force-wise, affects us across the board. This is not completely mandatory. If a company is unable to finance the project, then it is our problem within the Air Force to work out a V-loan or some extenuation of the circumstances of the company.

Mr. SHEPPARD. Has that impeded the progress that we have been discussing?

General IRVINE. If it has, I do not know it, because we can only get at the top tier. It is one thing to do business with Douglas or Convair. We worry in this sort of thing about what happens to the little fellows at the bottom of the heap, who might not be able to finance themselves; small-business people, we work with them.

Mr. SHEPPARD. That might be in the field of the subcontractor?

General IRVINE. Yes, sir. We have gone to this step. I personally interviewed 13 of the major companies involved in this program and directed them not to pass this thing down to their subcontractors without checking with us first.

Mr. SHEPPARD. Have you had any reason or cause to check into that to see whether or not that particular instruction that you have issued has been complied with by the prime contractors?

General IRVINE. I have no information to indicate that this has caused trouble, but this is a very hard thing to get hold of. We do have some investigations going on to determine this effect.

Mr. SHEPPARD. I may be in error about this, but is this a proportionate duty of the Federal Government in progress payments, to see at the time progress payments are received that the subcontractors are receiving their portion of the payments; or is it not?

General IRVINE. In my interpretation of our responsibilities, it is up to the prime contractor to look after his own business. It always has been an Air Force policy that we expected the prime contractor to handle his people, at least as well as we handle him, and we usually shake them up pretty good if we find out this is not true.

Mr. SHEPPARD. But, insofar as your auditing division is concerned in making its progress payments, it is not part of their responsibility to see that subcontractors are paid?

General IRVINE. No, because they have no legal or contractual responsibility. It is the responsibility of our administrative contracting officer at the plant to see that the prime contractor carries on his business in accordance with Air Force policy.

Mr. SHEPPARD. Who scrutinizes, if anybody, the payments in the progress category that are made, to see that they are within a degree of accuracy, if anybody?

General IRVINE. The Air Force audit system, the administrative contracting officer at the plant itself, is required to approve the sums that are paid to the prime, a portion of which is a justification, and the vouchers that come up from the subcontractors.

FUNDING OF NAVY MISSILE PROGRAMS

Mr. SHEPPARD. I see. Now, I ask the same question of the Navy: What has been your experience in the field of retardation of funds, whether it has been departmental or whether it has been from the sources of the Secretary of Defense and under the category of the so-called 1957 expenditure limitation? I am covering all of the fields, Admiral.

Admiral RABORN. Mr. Sheppard, our financial handling by the Navy has been very timely and fortunate. I have experienced no difficulties in withholding funds, if all I had to do was justify it, and this, of course, was reasonable, and fortunately we have been able to justify them and we have been able to meet our program and the dollars have been there when we needed them.

Mr. SHEPPARD. I repeat the same question to you I asked the general: In making your progress payments, have you issued any instructions or have any instructions been issued to you whereby those progress payments shall be a certain percentage, or presented as of, hypothetically, January 1, for example?

Admiral RABORN. May I seek the advice of experts?

Mr. SHEPPARD. Certainly.

Admiral RABORN. My comptroller tells me that we have the 80 percent directive. It has not been implemented, and as so, in effect, we have had no slowdown in payments or apportionment payments.

Mr. SHEPPARD. In other words, insofar as your contractual payments are in process of being, as it were, whether they be progress or otherwise, the 80 percent has had no influence upon your payments and that has had no influence insofar as retarding your program at all?

Admiral RABORN. That is correct.

FUNDING OF ARMY JUPITER PROGRAM

Mr. SHEPPARD. I ask the same question of the other branch of the military that is present.

General DALEY. I, unfortunately, do not have my experts here. I can answer just a portion of the question, and that is the last portion, that we, of course, have had no production as production goes in our funds. In the next place, our funds have been put out on a step-by-step basis. The research and development program is on schedule.

Therefore, I can only presume that the financial things have not delayed the Jupiter research and development program.

I am not speaking armywide, sir. I do not have the competence nor do I have an officer here with me.

Mr. SHEPPARD. You are addressing yourself to——

General DALEY. To the JUPITER program, itself.

Mr. SHEPPARD. Just that one?

General DALEY. Yes, sir.

Mr. SHEPPARD. Insofar as the other programs are concerned you have no information as to whether or not the retardation is effective insofar as progress payments are concerned? You do not know about that?

General DALEY. No, sir.

Mr. SHEPPARD. I have no further questions on the issue, Mr. Chairman. Thank you.

LETTER FROM SECRETARY M'NEIL

Mr. MAHON. I would like to put in the record at this point a letter from Secretary McNeil in regard to the withholding of funds as a result of the $38 billion limitation which was written about the time Congress adjourned.

(The letter referred to is as follows:)

AUGUST 14, 1957.

Hon. GEORGE H. MAHON,
Chairman, Department of Defense Subcommittee,
House Committee on Appropriations.

DEAR MR. CHAIRMAN: This is in response to your inquiry concerning the effect on the defense program of congressional action on the fiscal year 1958 Defense budget request.

The adjustments required in the programs of the Department of Defense for fiscal year 1958 are essentially those necessary to hold expenditures for the current fiscal year to $38 billion, the expenditure estimate contained in the President's budget submitted to the Congress in January.

It is possible that when the final program decisions for the current fiscal year have been made, we may find that congressional action on the Department's requests for new obligational authority for that year may affect certain programs in a minor way. Conversely, we may later find that in a few instances a small amount of the new obligational authority provided by the Congress for fiscal year 1958 in the annual appropriation accounts cannot be utilized effectively. All the funds provided in the no-year accounts, in my judgment, can be properly and advantageously utilized in reestablishing the long lead time programs on a fully funded basis.

The real problem posed by the action of Congress on the 1958 budget is that the appropriation of slightly less than $36 billion, including transfers, in support of a current program of $38 billion requires the utilization of essentially all of the carryover obligational authority which might otherwise have been available as a credit against the fiscal year 1959 request. While this action does not materially affect defense programs in 1958—it will require a budget request for 1959 of at least $38 billion to support a continuing program of this magnitude. This will create a psychological problem inasmuch as it will appear to the public as a substantial increase in the Defense budget, whereas in fact the level of the program would in that case remain the same.

Sincerely yours,

W. J. MCNEIL.

Mr. MAHON. Gentlemen, we are to have a report on the satellite program. I have no more questions myself at this time.

Mr. FLOOD. Mr. Chairman, I have been trying to ask some for about half an hour.

Mr. SHEPPARD. If you are going to permit that, I just have one question.

Mr. MAHON. Any others who have questions which are pertinent may ask them now, Mr. Sheppard.

Mr. SHEPPARD. I have just one question. Admiral, what has happened to the Vanguard program, if you have knowledge of it?

Admiral RABORN. May I refer the question to Admiral Clark, sir?

Mr. SHEPPARD. Anyone you desire.

Admiral CLARK. At 3 o'clock, I believe, Mr. Sheppard, you are scheduled for the Vanguard officer to be here to give you a progress and status report on the Vanguard at that time, sir.

Mr. SHEPPARD. Very well.

Mr. MAHON. Mr. Wigglesworth.

IMPACT OF FUNDS LIMITATION ON AIR FORCE MISSILE PROGRAMS

Mr. WIGGLESWORTH. I would like to ask Colonel Jacobson a question in regard to the statement he made. As I understand it you say as far as the ATLAS program and the TITAN program is concerned there has been no retardation by reason of the August directive that we have been talking about.

Colonel JACOBSON. That is correct, sir. The August directive was specifically on the IRBM.

Mr. WIGGLESWORTH. When it comes to the IOC program you said the IOC program was originally set back. You had originally money for R. and D. and operations?

Colonel JACOBSON. Yes, sir.

Mr. WIGGLESWORTH. Then a decision was made to defer the date of going to the operational production, we will say. It was deferred pending a decision between JUPITER and THOR. Is that not correct?

Colonel JACOBSON. There was a hold order placed against production, which in effect delayed the IOC program.

Mr. WIGGLESWORTH. Of course, that extended the original time at which we were going to get into operational production?

Colonel JACOBSON. That is correct, sir.

Mr. WIGGLESWORTH. Is it not a fact that pending decision or during that period of deferment, your research and development has continued?

Colonel JACOBSON. Yes, sir. At a reduced rate, sir.

Mr. WIGGLESWORTH. Why at a reduced rate? Has it not gone on at substantially the same level that you planned, if you separated from the operational production?

Colonel JACOBSON. No, sir, it has not. We had planned to hit a rate of ——— per month, sir, and to start assigning missiles from that rate.

Mr. WIGGLESWORTH. For R. & D. or for R. & D. plus operations?

Colonel JACOBSON. For R. & D. plus operations. In the meantime we should have been at an R. & D. rate now of ——— per month reaching to ——— per month. We have been restricted.

Mr. WIGGLESWORTH. Assuming you were going into operation at the date originally contemplated?

Colonel JACOBSON. Assuming you were going to carry out the R. & D. program at the rate originally contemplated.

Mr. WIGGLESWORTH. Was that not based on the missiles you were going to put into operational production?

Colonel JACOBSON. To the Air Force, yes, sir, to achieve the earliest possible operational capability.

Mr. WIGGLESWORTH. So the R. and D., if reduced, was simply reduced in step with the operational production which was originally contemplated and subsequently deferred?

Colonel JACOBSON. I think you could put it that way, sir. The effect of reducing either the R. and D. or the operational buying now delays the IOC.

Mr. WIGGLESWORTH. That is all, Mr. Chairman.

Mr. MAHON. All right, gentlemen, are there any further questions? Mr. Sikes?

MISSILE NOSE CONE DEVELOPMENT

Mr. SIKES. Admiral Raborn, did I understand you to say this morning that on POLARIS you have solved the nose cone reentry problem?

Admiral RABORN. Yes, sir. We feel we have the basic problems which have to do with this particular type of nose cone solved.

Mr. SIKES. The Army feels it has solved the nose cone reentry problem on JUPITER?

General DALEY. Yes, sir.

Mr. SIKES. What is the situation with Air Force, General Irvine?

General IRVINE. We have accomplished with Lockheed test vehicles successful firings with the nose cone. This vehicle was set up by us with Lockheed to test the reentry problem and we completed the tests quite successfully.

Mr. SIKES. Do you feel you have solved the nose cone reentry problem as far as THOR is concerned?

General IRVINE. We solved it as far as the ICBM was concerned and we propose to use the same nose cone on the THOR so this gives a safety factor of 10 to 1.

VANGUARD PROJECT

Mr. SIKES. Let me ask the Navy when you can launch a satellite.

Admiral CLARK. The schedule for the first satellite at the present time is early December, and the previously scheduled satellite is in March.

Mr. SCRIVNER. Is that the Vanguard?

Admiral CLARK. That is the Vanguard.

Mr. SIKES. Have you been given all the authority that you need to launch the satellite as soon as you can?

Admiral CLARK. Yes, sir. All restrictions are off overtime. It has highest priority.

ARMY SATELLITE PROGRAM

Mr. SIKES. Let me ask this of the Army: When can you launch a satellite?

General DALEY. In the last part of January.

Mr. MAHON. If given the go-ahead today.

Mr. SIKES. Have you received the go-ahead?

General DALEY. We were verbally notified last night we could go ahead.

Mr. FLOOD. When?

General DALEY. Last night I got notified—I received a notification at about 1830 hours.

Mr. FLOOD. What hour is that?

General DALEY. Six-thirty in the evening.

Mr. FLOOD. By telephone at 6:30 last night?

General DALEY. I received it by telephone from inter-Army channels, sir.

Mr. SIKES. Are there any limitations on Army, moneywise or otherwise, which might interfere with the earliest possible launching?

General DALEY. My understanding now is none, sir; none. I will amend that and just say none, sir.

Mr. FLOOD. You got that from somebody in the Army by telephone?

General DALEY. Yes, sir; but this was repeating a notification, and I do not know whether this came by paper or what not. I got it and I said "This is official notification to me?" and he said "Yes" and I turned around and saw that General Medaris got that notification. I transmitted it to him last night, sir.

Mr. FLOOD. It should work out all right. Go ahead and shoot it.

OPERATION DATE FOR IRBM

Mr. SIKES. Let me ask the Air Force: General Irvine, when do you propose to have IRBM's operational, on site, in Europe?

General IRVINE. As I said this morning, we could have an operational unit available in 1958. There are a few State Department problems and other things that we do not quite have control over.

Mr. SIKES. Do you have full authority to proceed in a way that it will make it possible for you to be operational on site by 1958?

General IRVINE. No. The existing program that we now have that is fully approved is a year later than we think it ought to be.

Mr. SIKES. What is holding you back? What authority do you need to put it on site a year earlier than you now propose to put it on site?

General IRVINE. Off the record.

(Discussion off the record.)

AIR FORCE SATELLITE PROGRAM

You asked me earlier about the satellite program. We have looked at that to see what might be possible, and I think our ideas are not particularly different than the Army; that is one of the things we have kicked around in the Air Force.

SIMILARITY OF THOR AND JUPITER

Mr. SIKES. Tell me whether THOR will have to have a permanent launching pad or may be fired from mobile launching sites when it is operational in Europe.

General IRVINE. Actually the THOR and JUPITER get more alike every day. They have the same engine.

Mr. FLOOD. What?

General IRVINE. Same engine.

Mr. MAHON. Same booster, same powerplant.

Mr. FLOOD. That is not what we were told yesterday.

Mr. MAHON. We were told wrong then.

Mr. FLOOD. You sat here with me.

General IRVINE. Maybe some of the attachments to put it in that particular machine might be different, but these engines came out of a rocket engine program at North American. We have built engines at North American for REDSTONE and JUPITER. This is no different than the Navy builds engines for Air Force airplanes.

Mr. SIKES. Must the launching sites be mobile or permanent by the time you are operational in Europe?

General IRVINE. Whatever you can do with one you can do with the other. I would like to say we have over 150 wheeled vehicles already developed and the majority of them in use at Patrick for the support of the THOR program and I think about the same vehicles are used on the JUPITER.

Mr. SIKES. Do I understand you to say by the time you are operational in Europe you can use mobile-launching sites?

General IRVINE. As mobile as anything can be that uses liquid oxygen for a base.

OPERATIONAL DATE FOR IRBM

Mr. SIKES. General Daley, when do you now propose to have IRBM's operational on site in Europe under your present schedule?

General DALEY. I have no authority to put IRBM's any place, sir, nor to produce production IRBM's.

(Discussion off the record.)

ACCELERATION OF POLARIS

Mr. SIKES. I was gratified this morning when Navy told of the speedup in the program for POLARIS. Is there any authority or money that could put POLARIS in the air as an operational weapon earlier than you showed us this morning?

Admiral RABORN. No, sir. I think not. This is an answer as of today, Mr. Sikes.

Mr. SIKES. Is the submarine your real problem in that connection?

Admiral RABORN. You do not need a submarine to get it in the air. We will fire it from the beach first, anyway. But speaking for the missile alone, we have essentially had some remarkable successes which we had not really expected but we are liberally utilizing the scientific and technical talent and knowledge that the Army and Air Force has had a little ahead of us and for that reason we have come along faster.

Mr. SIKES. Your answer is today you do not need more authority or money than you have.

Admiral CLARK. That is not quite correct.

Mr. MAHON. You told us this morning how you could expedite the program. He said beyond what you told us this morning——

Admiral CLARK. If you are talking about the accelerated program, that is correct.

Admiral RABORN. That is what I understand. It may change next month.

Mr. SIKES. Army has been told to proceed forthwith to launch a satellite and have not been told to proceed to develop IRBM's for use in Europe?

General DALEY. No, sir; we have not.

Mr. SIKES. You were told last night full steam ahead on getting a satellite in the air.

General DALEY. Yes, sir.

Mr. SIKES. Admiral, you were told last night to speed up, were you not?

Admiral RABORN. My plans for the speedup have been in the hands of the Secretary of the Navy and he in turn made his recommendations to the Department of Defense, I believe, November 22.

Mr. MAHON. 22, that is tomorrow.

Admiral RABORN. October 22, pardon me.

Mr. SIKES. I thought you said this morning you were told last night to move ahead on this accelerated program.

Admiral RABORN. I was given final approval of this acceleration for planning purposes.

Mr. SIKES. When?

Admiral RABORN. Last evening.

Mr. SIKES. What time?

Admiral RABORN. 6:30.

Mr. SIKES. Does 6:30 p. m. last night mean anything to you, General Irvine, for a speedup on missiles by Air Force similar to that received by the Army and Navy?

Admiral CLARK. May I add something, sir? The difference between the Navy POLARIS program and the other programs is that in our program we include not only the missile itself but the submarine, the navigation problems, and the whole ball of wax.

We have gone ahead for some weeks on the basis of expediting the missile.

ACCELERATION OF THOR

Mr. SIKES. General Irvine, since October 4, when Sputnik I took to the air, have you received any instructions to speedup your program on THOR?

General IRVINE. It is my understanding from General Bogart that several days ago we got word to go ahead on what to me is an in-between program which was the second program that Colonel Jacobson spoke to you about for planning purposes.

Mr. FLOOD. Not last night? I am disappointed.

Mr. SIKES. That is not a full-speed program but an in-between program?

General IRVINE. Yes, sir.

Mr. SIKES. You received this 2 days ago.

General IRVINE. Yes, sir, roughly.

Mr. SIKES. That is all.

Mr. MAHON. Mr. Flood.

THOR AND JUPITER ENGINES

Mr. FLOOD. Mr. Waggoner, late yesterday afternoon you gave us the best comparative detailed analysis of JUPITER and THOR that I ever heard. In the course of it you touched upon the engine and from your notes you took great pains to point out that as far as you were concerned the engines in THOR and JUPITER were simply two blond females but in any other way they were not alike. You said that it was an engine made by somebody here and that it had a pipe and that was the same, but simply because it was an engine with this in it and simply because it had a pipe of some kind it was not the same.

You very carefully, and I am sure correctly, went on to say that as a matter of fact these engines were not alike.

Up until you spoke, everybody had told us that the engines were identical, or similar. Semantics have dominated this thing more than facts anyhow. You go ahead with your part.

Mr. WAGGONER. The statement I made yesterday was to go from one engine to the other required about 3 months' work at the factory. They are not interchangeable in the missiles without this amount of rework and I stand on my statement.

Mr. FLOOD. They are two automobiles, that is how alike they are.

Mr. WAGGONER. Yes, sir. Except they will both power a missile 1,500 miles.

Mr. FLOOD. But the inference, of course this may be my fault——

Mr. WAGGONER. Pardon me, sir.

Mr. FLOOD. Go ahead.

Mr. WAGGONER. The difference is a detail. As I mentioned yesterday in outlining the differences between the 2 missiles, if you are talking just ballistic missiles, the 2 missiles are similar. If you are talking types of components in the missiles, again they are similar. But if you get down into the specific detail, they are markedly different.

Mr. FLOOD. Certainly. The engines are not alike—period—except that they are engines to fire missiles with a basic similarity of certain components that are in the same engine. That is what they are. But from then on they are different engines, certainly.

Mr. MAHON. I do not like to belabor the point here, but some of us were out at North American and if I am not mistaken, North American makes these engines for both missiles.

Mr. FLOOD. Ford makes five different kinds of automobiles, too.

Mr. MAHON. They are, basically, the same engine. You can finish the engines a little differently to adapt to a particular missile, I understand, but, otherwise, they are fundamentally the same engine or else I am mistaken.

Mr. WAGGONER. Perhaps I should clarify it further. The engines, basically, so far as the thrust chamber and turbines, are the same engine, but, as I mentioned yesterday, the lead time from the point of order to delivery of the engine is 12 months. The last 3 months the engines go down separate production lines, both made by North American, both deliver certain amounts of thrust and certain performance levels, but they are not interchangeable on the missiles without extensive rework.

Mr. MAHON. You said that yesterday.

Mr. FLOOD. That is what I mean. There has been too much in this entire thing. This general would have said at the dinner tonight, with all sincerity, the engines are alike, and everybody in the United States, including this committee, up until this man spoke last night, thought that—alike to me means only one thing, they are similar or identical except for unimportant and immaterial distinctions.

That is not the case. There is material difference. They are not alike. They cannot be interchanged, and that is it. That is important. There is too much of that misinformation and misunderstanding in the entire program. That is serious.

Now, let me inquire about something else. I would like to talk to you——

Mr. MAHON. We have 20 minutes for 4 men.

Mr. FLOOD. Let them all talk. Let them go ahead. Nobody has touched this naval thing. A lot of things I want to develop. Everybody has been asking questions here since we came in. You asked me to keep quiet, and I did.

Mr. SCRIVNER. Everybody except Ford, Ostertag, and me.

Mr. MAHON. Mr. Riley, any questions?

Mr. RILEY. Admiral Raborn, would there be any——

Mr. FLOOD. I will not bother asking these people any more questions. I am dissatisfied with this.

USE OF POLARIS ON LAND AND SEA

Mr. RILEY. Are there any radical changes necessary in using the POLARIS on land as against the use of submarine or destroyer?

Admiral RABORN. Our missile is pointed toward use at sea, either in a submarine or surface ship. Because it has to be efficient in the sea environment and to take care of the roll and pitch of the ship and the sea workings of the ship, it is a more sophisticated missile-guidance system than you might expect for just land use.

In other words, we have some gear in there which would not be required for land use.

Mr. RILEY. In other words, if I understand you correctly, you could use the same weapon on land with more simplified gear.

Admiral RABORN. Yes, sir. We plan to do our initial firings from land for safety reasons to prove it before going aboard ship. In effect, it is usable.

Mr. RILEY. It can be used on both land and sea, but the use at sea would require special gear to compensate for the roll.

Admiral RABORN. It is specially adapted for use at sea. It is smaller, more compact, more rugged. As I said before, the inertial guidance system, the platform itself, takes into account and allows for, rather, the maneuvers of the ship which are not only that induced by the waves but also by the ship captain turning his ship around. We have some things we would not necessarily need for land use in it.

SIZE OF POLARIS

Mr. RILEY Is that heavier or lighter than the THOR and JUPITER?

Admiral RABORN. It is a smaller missile.

(Discussion off the record.)

MOBILITY OF POLARIS

Mr. RILEY. In your opinion, Admiral Raborn, could this weapon be fired from a mobile launching arrangement, or would it have to have a permanent pad on land?

Admiral RABORN. In my opinion, sir, this could be adapted to both. As a matter of fact, we have a fixed pad arrangement at Patrick, and we are also building a ship-motion simulator. While it is anchored in the ground, it does simulate the motions of the ship, so we can do our training and firing from it.

Mr. RILEY. If somebody wanted to use it on land, leaving out your naval gear, could it be operated from a mobile launching arrangement?

Admiral RABORN. I am confident it could, sir.

(Discussion off the record.)

Mr. RILEY. On land it could be readied for firing at the place where it is to be fired.

Admiral RABORN. Yes, sir. We plan to do that at Patrick, where we will do our initial test. Just like the others do, we will prepare it for firing right at the platform or launching pad.

SOLID- AND LIQUID-PROPELLANT ENGINES COMPARED

Mr. RILEY. I asked some of these questions yesterday. I want to know which is the best weapon and who can get it there first.

General IRVINE. I would like to speak to this. I have been in it a long time. I talked the Democratic Secretary of the Air Force out of the money to buy the first rocket engines. They thought I was crazy. It was not easy. The reason the Air Force went down the liquid-engine route for the ICBM was that this was the only way we could get, in the time period, the very great thrust required. When we were given the job of building an IRBM, we still were not sure of the time period of the rate of progress on the solid propellent.

There is no question in the minds of any of us, technically, that the solid propellent route is the safest, cheapest, shortest reaction time machine and lends itself to mobility but there is a development problem. I sit back with great interest and watch my friend work with the idea that we can pull out pieces for our use when they are ready.

SOLID PROPELLENT ENGINE FOR LAND-BASED MISSILE

Mr. RILEY. Are you pursuing—either the Air Force, Army, or Navy—the development of this weapon for land use as vigorously as you are pursuing it for naval use?

Admiral RABORN. No, sir. My directive is to put it in ships at sea, submarine, as soon as we can.

Mr. RILEY. So far as you know, there is nobody trying to develop its use for land, making the necessary modifications.

Admiral RABORN. We are keeping this in mind.

Mr. RILEY. Let's get down to brass tacks. Is there anybody developing this weapon, making the modifications for land use?

Admiral RABORN. Off the record.

Mr. RILEY. Thank you. That answers the question.

General IRVINE. We have had some study programs going on in the Air Force for 7 years on solid propellents. We backed off from this job to do the job we have been assigned because the Navy was carrying forward for their use.

Mr. MAHON. The point is you were able to get there first with the liquid oxygen, you would rather have had the solid propellent all the time, you could not get it. It will be a little delayed because it is harder to develop and that is the whole point.

Mr. RILEY. That is perfectly agreeable to me. I am glad they did it, but there are going to have to be some modifications to POLARIS if it is to be a successful weapon on land.

Mr. MAHON. Mr. Scrivner.

COOPERATION BETWEEN SERVICES IN MISSILE PROGRAMS

Mr. SCRIVNER. General Irvine, I assume from what you said a moment ago that the Air Force has been working and will continue to work with the other services on not only the missile program but the other.

General IRVINE. Everything.

Mr. SCRIVNER. If I am correctly informed, in practically all installations, where POLARIS or THOR or TITAN or JUPITER or REDSTONE or whatever it may be made, we have representatives of the services working together; is that correct?

General IRVINE. There is one indication, I asked Secretary McElroy when he was Secretary-designate to look at the POLARIS presentation at Lockheed. I told him this was one of the most forward-looking developments we had and we were working with them and hoped to shred off some of it at the appropriate time. I look at the fact when I ask for ——— squadrons of THORS or JUPITERS, depending on the decision, that they will be replaced at some point, due to the greater mobility and cheaper cost with a solid propellent machine. I think it is coming right out of the Navy development.

ARMY DIRECTIVE TO LAUNCH SATELLITE

Mr. SCRIVNER. Quite a bit of play was made a moment ago, General Daley, on the fact that you had received some directive at 6:30 yesterday evening about proceeding to launch a satellite.

General DALEY. Yes, sir.

Mr. SCRIVNER. That is not the first information or directive you have had about JUPITER launching the satellite, is it?

General DALEY. We had a directive previously to be prepared to launch a satellite.

(Discussion off the record.)

Mr. SCRIVNER. When you say this you are talking about last night?

General DALEY. Last night we were told to launch in January.

Mr. SCRIVNER. That is the difference between the one in the preliminary order you had. The other one was March.

General DALEY. Yes. And it was not to launch. It was to be prepared to launch.

Mr. SCRIVNER. I know, but the Army was probably quibbling over a few words and the meaning of a few words and probably the emphasis on the 6:30 thing has not been as important as some people would like to make it. That is my opinion. I do not know whether anybody else agrees with it or not.

Mr. OSTERTAG. I agree with it.

MAJOR DIFFERENCES BETWEEN JUPITER AND THOR

Mr. SCRIVNER. What I have been listening for is for somebody who knows what he is talking about to tell me what the big major difference between JUPITER and THOR may be, whether it is 1, 2, 3, 4, or 5 instances.

But first, before I have that, I would like to have you tell me, General Daley, because you mentioned JUPITER–A and JUPITER–C, which are nothing more nor less than offspring of REDSTONE as I understand it, but you did not tell what in the world JUPITER itself is or will be, rather. If you do not have it now, it will be what?

General DALEY. A liquid propelled 1,500-mile missile.

(Discussion off the record.)

Mr. SCRIVNER. That definition would fit THOR, too, would it not?

General DALEY. Yes, sir.

Mr. SCRIVNER. With all of these missile experts here, can somebody tell me and this committee what are the major differences between THOR and JUPITER? If there is any difference, let's have it. If there is not, why all of the argument and dispute and headline seeking? You are all serving under the same flag. You are all a part of the Department of Defense. You are all part of the defense of the United States of America. Let's get going on this thing. I do not know why there should be any rivalry, which to me sometimes indicates bitterness, although I honestly believe it has not particularly impeded the progress on the missiles. It has had a very bad public reaction although I do not actually think it has delayed production of missiles at all.

Who can tell me what the differences are while we have all the services here together, experts on missiles?

General IRVINE. I think Colonel Jacobson is more familiar.

Mr. SCRIVNER. I do not care who. Here is a JUPITER man and a THOR man. Put it out on the table.

Colonel JACOBSON. I think, sir, that the earlier statements by Mr. Waggoner that essentially they utilize the same type components and everything is quite accurate.

Mr. SCRIVNER. That is my impression. Both use inertial guidance, use the basic engine modified for each, as was pointed out.

The construction that we currently have in the production THOR's is the type construction which the Army proposes to go to.

(Discussion off the record.)

Colonel JACOBSON. I think the Air Force position is and has been expressed that we see no problem that would prevent either service from developing an IRBM successfully. Either JUPITER or THOR could be successfully developed. The Thor, however, started out on production tooling and is in a position to move much more rapidly into operational units in the field.

I think for a short statement, sir, this is a summary of the case.

Mr. SCRIVNER. As I see it there is enough difference from what we were told yesterday that if you had a man trained on JUPITER he would not be able to do his similar job on THOR, would have to be retrained?

Mr. WAGGONER. I said that.

General DALEY. That is correct, that certain individuals would have to be retrained.

REASON FOR PRODUCING BOTH THOR AND JUPITER

Mr. SCRIVNER. The suggestion was made we go on both. But then you are setting up 25 types of ground-support equipment, 2 different sets of training. Where that is any great advantage I wish somebody would tell me, except that you would have two lines of production and you would have more missiles but they would be different, in the field and operational quicker. What is your observation, Mr. Waggoner?

Mr. WAGGONER. The primary reason for two of them at the present time, you may recall in the charts that were presented this morning that both missiles go through a certain buildup route.

Mr. SCRIVNER. Yes.

Mr. WAGGONER. The real reason if the decision should be made to go to both of them would be that there is felt to be a need to have as many missiles as quickly as possible at the earliest practical date in the field in order to essentially beat that lead-in curve because, as soon as such time has elapsed, either missile as far as I am concerned can meet the basic requirements.

Mr. SCRIVNER. I have no choice, I have no preference between THOR or JUPITER and I certainly have no prejudice against the Army and no favoritism for the Air Force. As far as I am concerned they are all a part of the defense system of the United States of America and their pay comes out of the same taxpayer's pocket.

It has hurt me to see some of the things said that have been said, many of which have been exaggerated. But if somebody, the sooner the better, will make a decision and let's go from here, the better this committee is going to feel and the better off the Nation will be.

I know Mr. McElroy and Mr. Quarles are not the ones that in themselves make the decision. They have to act on advice of men who are scientists, trained and familiar in this field of activity, tell them to give us a quick decision, even though it may not be the best.

Mr. WAGGONER. Off the record.

(Discussion off the record.)

Mr. FORD. General Irvine, this morning General Daley said that in his judgment—and I think that probably reflects Army opinion — it would be well at this point to go into a production schedule on both JUPITER and THOR.

What would your opinion be on that question?

General IRVINE. The real answer to that question is how many missiles do you want in calendar 1958 and 1959? The Air Force program productionwise is a little ahead. This is a matter of opinion whether it is 2 months or a year. The question of operation in the field, the reason I happen to know something about this, in spite of the fact I am a production type, is I am also an operational fellow and we went into our program on ground-support equipment on THOR at the same time we developed the missile, at the same time we trained some people, because the best missile in the world is worth nothing unless you have all the support equipment and people trained to operate in the field. We went after this machine just like a B–52 bomber or anything else.

So if the country is satisfied with the number of machines the Air Force can build alone or the number that you can build of JUPITERS alone, either one will do the job.

With the Air Force machine we can get there a little quicker because we started first. It is almost that simple.

Mr. FORD. It would be my observation of the attitude of the committee or a substantial number of them that there is the utmost urgency about time in this situation and as I have listened to testimony here and elsewhere from military people of all services, time is also somewhat urgent in this area. What would your military recommendation be, both THOR and JUPITER or one or the other?

Mr. SCRIVNER. I can answer for him.

Mr. FORD. I want him to answer.

General IRVINE. I should have retired 9 years ago. I can see that now. I am only on 25-percent pay anyway.

Mr. FORD. It is important. I think we all have the impression from the Army and I think the committee wants that kind of information.

General IRVINE. I am not really qualified to talk about the JUPITER missile because I know very little about it. That is why I asked Colonel Jacobson to talk because he has been at both plants. I am very sure of what the Air Force can do. I have no comment about what the Army says they can do. This is their business.

The decision about how many missiles you want and what time, this is a decision for the Secretary of Defense and the President, the administration.

Mr. FORD. In your judgment as a production man and as a military operation man, what do you think? Should we have both right now? That is important to this committee. That is one of the reasons we are holding the hearing.

General IRVINE. Whether additional units are necessary, whether we ought to build a JUPITER in addition to the THOR, this is something on which I am absolutely not going to make a recommendation because this is not my job to say what the Army should be doing.

Mr. FORD. Let me ask you this.

General IRVINE. They are doing a good job on what they are doing and deserve credit for it.

CONTINUATION OF MANNED AIRCRAFT PRODUCTION

Mr. FORD. We heard an awful lot in the last several days about the missile program. We have not heard very much about manned aircraft. Over the last year or so we have heard a lot about manned aircraft, B–52's, B–58's, and various other aircraft. It seems to me that when you are talking about IRBM's for next year and the year after, you are talking about certain responsibilities that currently relate to military objectives of your B–47's, your B–52's, and your B–58's. Is that right?

General IRVINE. That is right.

Mr. FORD. Now if the decision is made to go ahead on the IRBM program on a full-scale production both JUPITER and THOR, what would be your view as to whether or not we ought to continue our present B–52 production program and the initiation of a B–58 program?

General IRVINE. I am glad you asked me that question.

Mr. FORD. I think that is important for this committee.

General IRVINE. It is. When we started the intermediate range ballistic missile program initially we talked about 1,000 and got up to 1,500 miles. At that time we stopped development of tactical bombers at Martin because we felt this was a good tactical bomber and should not throw away the taxpayers' money on two similar developments. We elected to keep fighter bombers, a cheaper, shorter range machine, to do the thousand mile and under mission where necessary to complement missiles that the Air Force and Navy and Army are developing for the shorter range purpose.

As far as the long-range job is concerned, there are two very different jobs that need to be done. Talking about the B–52, it will carry hydrogen bombs that are bigger than any you can put in a missile of any kind yet under development. So this is a real Sunday punch.

Going back to my own SAC planning when I was still working for Curt LeMay with the 8th Air Force, our projected plans were 10 years ahead then and indicated that the B–52 program was necessary to do part of the job. We feel in the initial phases of either the IRBM or ICBM we will have relatively low reliability, relatively low accuracy. I say that because of my experience with bombers over a period of 20 years.

Mr. SCRIVNER. That is related to manned bombers.

General IRVINE. Yes.

Looking ahead in our planning 15 years hence about what the structure of the Air Force should look like, and in that time period we expect to have manned machines. Now, maybe I am a little starry eyed, but I think a missile is a wonderful thing, but it gets far more wonderful if you put a man in it to add the judgment factor. So we are looking ahead right now. The B–58 is again a medium bomber. This is a replacement for the B–47. We want to be able to go in high and go in low with the bombers and shoot the missiles too. If the enemy ever knows that you have only one way to get at him he can certainly take care of that. But if he does not know whether you are going to shoot him with a missile shot out of England or north Africa, or whether the Navy is going to lob in a Polaris, or whether we are coming high or low with bombers, he cannot stop that system. It is impossible for him to stop all those methods of approach.

We feel strongly about this. In addition to plans for taking Triton and improving that and putting in some of Navy's inventions to

make it a better machine, we are planning another Mach 3 bomber, which we do not expect to buy in large quantities, in order to still have a further Sunday punch.

RELIABILITY OF MISSILES IN EARLY PHASE OF PRODUCTION

Mr. FORD. If you went into production today—and I would refer this to both you, General Irvine, and General Daley—on THOR and JUPITERS, at least in your initial production, and perhaps in your first production models, you would probably end up with a missile that would have less accuracy, less reliability, probably cost more, but timewise you would save some time; is that about a good summary of the situation?

General IRVINE. That is right. That is true of any weapon system.

Mr. FORD. If you waited 6 months, or whatever the time might be, you would end up in your first production model with more accuracy, more reliability.

General IRVINE. No; that is not necessarily true. It has been my unfortunate experience in the airplane business that you test until you are black and blue in the face on a handful of machines, but you never know what you really have, you never get a real operational capability until you have a whole wing's worth, a tactical unit in operation and actually submit them to the test of a true military mission a number of times. That is our operational readiness test procedure.

We flew two B–52's 600 hours in 2 months. We thought that we had them fixed. When we got a couple of wings worth in operation a very large number of unpleasant things happened so we had a nice modification program. Anybody that thinks that will not happen with missiles is just crazy. It just happens to us. We always have trouble with every machine. You do not know until you get them in service.

Mr. FORD. What would be your observation on the JUPITER program, General Daley?

General DALEY. I would say that if you delayed the first missiles that were made available to troops it would be more reliable than the one that you would go into production on now. However, General Irvine's point is very well taken, the sooner the troops get their hands on a missile the sooner you find out if it has any bugs at all, and therefore how you measure this I am not sure.

General IRVINE. It gets down, as has been said, to a question of training people.

INTERSERVICE RIVALRY

Mr. OSTERTAG. I want to ask this general question of all the 3 services because it has been said time and time again that one of the great problems involved in this interservice rivalry has been the withholding of vital and helpful information on the part of 1 service from the other. Is that a fact? Is that a part of the scramble, really denying each other information which would be helpful?

General IRVINE. I think there is nothing healthier for this country than interservice rivalry, so-called. I would say if anything helped the Air Force to work like hell on the THOR it is the fact we knew the Army was clawing at our backs. Not being too stupid, when we see

the Navy doing something really brilliant engineeringwise, we say that we would like to put out some too. I have been in the Army longer than I have been in the Air Force. With some of the compatriots that I worked a long time ago in the Navy, we finally evolved a system that if they had something we took it, and the whole Pratt & Whitney series of engines came out under the Navy. We would use each others' equipment.

Take the J–57 engine, a Navy development. They put an engine in their A–3D, which is the same engine we put in our bomber. I think this sort of thing is really good. You do get to the point where administratively, in the Congress and in the administration, you have to make a decision once in a while about who is going to have what job. We have taken a strong position in the Air Force we want an intermediate range missile. Naturally, we would like to build the one we developed to fit our own particular needs, but we have said we will operate happily the JUPITER if the decision is made that is the one that is going to be built. If that is interservice rivalry, I like it.

Mr. OSTERTAG. My question involved the withholding of vital information on the part of one service from the other because of this rivalry. In other words, they were not cooperating to the extent they could be helpful in getting the end result. Is that a fair criticism?

General IRVINE. You always have in any service, or in Government, small-minded people. You can always pick some guy who will not play the game straight. As far as the work we have been doing with the Army where they have gotten in with us in the development of engines, and in our work with the Navy in many other areas, I think that has not been too much of a problem. Sure, you have rivalry.

Mr. SCRIVNER. You still have not hit right at the point of Mr. Ostertag's question—Has the Air Force withheld from either the Navy or the Army any pertinent important information about their developments in the missile program?

General IRVINE. We have had a wide-open setup at the Western Development Division. We have had the Army and the Navy people in there. We created the Patrick center and range for people to use, and we are darned happy to spend part of the taxpayer's money for the other two services to use the same range. So, if we have held any information from either of the other two services, on anything, I do not know anything about it.

Mr. OSTERTAG. These statements have been made in public by people in high places in the Defense Department and are in a position to exercise some knowledge as to this conflict of interest, and apparently you do not believe that is so, or you do not want to comment on that point.

General IRVINE. It either is not so, or it does not amount to much.

Mr. OSTERTAG. What about you, Admiral Raborn, do you care to comment about this interservice rivalry with regard to information being available to each other?

Admiral RABORN. I would be pleased to comment because we have had singularly good relationships with the other two services. The Army and the Navy were partners for a couple of months and we enjoyed the finest kind of technical companionship. Last year it was my pleasure to load my entire technical staff aboard a Navy plane and fly out to the west coast and spend 2 days with Bernard Schriever at

his headquarters where we had a frank exchange of technical information and where we set up first-name relationships between our technical people. So I think as far as I am concerned this is a myth and I cannot explain it. I think there is no truth in it.

Mr. OSTERTAG. General Daley, will you comment on the question?

General DALEY. Sure. I am certain that there are probably instances of this in any of the three services, they being such large organizations. I am sure that it could be shown. As far as the THOR and the JUPITER missiles are concerned, and the POLARIS, as Admiral Raborn has said, for a long while Admiral Clark and I were a two-man committee on the JUPITER program, so the exchange was complete. We have Air Force liaison officers at the Army Ballistic Missile Agency and Army liaison officers at the Western Development Division, and we have complete exchange of information with Admiral Raborn, so I feel in this program it would be very difficult to charge anything off to interservice rivalry. There may be some minor exceptions. I would say that the rivalry has, as General Irvine has said, put the pressure on us. The Air Force work has kept our nose to the grindstone.

General IRVINE. And ours.

General DALEY. If you will go back to the start of the ballistic missile programs, the reason that they had to was because the thing that the country was looking for was the earliest capability with a missile of about 1,500 miles range and reasonable accuracy. That is still the criterion and that is the reason for the two programs.

Mr. SHEPPARD. I have been very much interested in the same problem you are presenting to the gentlemen here. As near as I have been able to analyze it, that thought emanates from the mentalities that are advocating the one-service aspect. I think if you will get behind the ghost you will find what is walking and it is invariably predicated upon that concept.

Mr. SCRIVNER. Within the last 72 hours I have read an article which said in so many words, General Daley, that the Air Force officers who have been sent down to Redstone to work in the program had a more difficult task getting into the Redstone Arsenal than perhaps some foreign visitors would have.

General DALEY. We are in a sense the contractor for the Air Force. If some Air Force officers do not get into the Army Ballistic Missile Agency we will be out of business.

Mr. SCRIVNER. You did not answer my question.

General DALEY. I cannot speak from personal knowledge.

Now, the committee will be down there tomorrow, and I would certainly recommend that you raise that direct question with General Medaris. I feel that he can probably answer it.

COORDINATION OF SUBMARINE CONSTRUCTION AND MISSILE CONSTRUCTION IN POLARIS PROGRAM

Mr. OSTERTAG. I would like to ask Admiral Raborn about the timetable, or the coordination of the construction and the programing of submarines and your POLARIS program. Are they being synchronized in programs so you will have submarines at the same time you have completed the development of the other, and vice versa?

Admiral RABORN. Yes. I have responsibility for both. We have a one-package deal here. The submarines are being developed cur-

rently with the missile and the rest of the system so that they will come out of there about the same time.

Mr. OSTERTAG. Do you have any estimate as to the total numbers?

Admiral RABORN. No, sir. That is a matter for the Chief of Naval Operations to determine.

Mr. OSTERTAG. I mean in the program.

Admiral RABORN. In the program down the years, I have not.

TRAINING AND SUPPORT NEEDED FOR THOR

Mr. OSTERTAG. I would like to ask General Irvine in connection with the entire picture of the development of a successful intermediate range missile, assuming the THOR to be operational today, and you claim you could do business if you had the word to go ahead with production, how much more time will it take to provide all of these things, including training, for the support of such an operation?

General IRVINE. That approach was the basis of my statement, that it would be next year. We can forecast the time all right in which we will have the training unit at Cooke Air Force Base but to forecast the time at which we could actually get into a base like England, if that is the place, is an area in which I do not operate.

Mr. OSTERTAG. I am not thinking in terms of acquiring sites, or getting agreements in foreign countries. I am thinking in terms of the support hardware of the essential parts that make a missile operational.

General IRVINE. The support equipment?

Mr. OSTERTAG. Yes.

General IRVINE. The support equipment that goes with the THOR, or our other missiles, is planned to feed along with it. We do not expect to bring out missiles without the material to make them work, or the people. We have some highly experienced people now as a nucleus at Patrick. We are getting a lot of experience. We are activating another group at Cooke Air Force Base. We have several hundred people in training and others scheduled to go. Right there is one of the things that I am most unhappy about because in our hold down to two a month, that not only delays our programing, the purchase of the missiles and the support equipment, but it also delays the training of the people. So that is why this delay of 4 months could add up to an operational delay of 6. That is one of the very serious increments in the program.

NEED FOR DECISIONS TO BE MADE

General DALEY. May I make a statement? This is minutiae, but I would like to correct the record on one thing. You said, I believe, something to the effect you all have a go ahead on solid propellent missiles. In the Army's case we have a proposal to the Department of Defense on a solid propellent missile, but we do not have as yet a complete green light. With that I will keep quiet.

Mr. WAGGONER. I would like to correct one possible impression. Yesterday when Secretary McElroy and Mr. Quarles were here, they possibly gave the impression that there were decisions not made at that time. This morning the various speakers mentioned that these programs did have approval. I would like to clarify that to this

extent: Secretary McElroy mentioned yesterday that the Defense Department is in the process right now of putting the whole ball of wax together. The programs which were approved and which were presented here today were approved yesterday for presentation to the National Security Council. There may be some minor changes but it is the best position the Department of Defense has at this time, and I think it goes without saying there is going to be an acceleration of some magnitude in the ballistic-missile field.

DANGER OF COMPLACENCY

Mr. MAHON. I want to say that yesterday I was a bit displeased by the hearing. I have great admiration for the new Secretary and Mr. Quarles, who is an old friend of this committee, but I detected a sort of "business as usual feeling"—what we have done has been right, we were not caught off base or excited about the sputnik, we are going ahead and we will do more or less what we planned to do all along. That kind of general attitude is something like a spirit of complacency that I do not think was too good. I have not repeated that to anyone except some of the members of the committee. I think we might just as well face up to the fact that we have all changed our thinking somewhat since about the 4th of October, and I think it does no discredit to change our thinking and change our schedules and change our programs and policies. I do not think it reflects upon anyone's intelligence or judgment to do it.

Now, I just felt yesterday they were playing their hand too conservatively.

Mr. WAGGONER. Perhaps that may be so, sir. The position yesterday, and I might say the position today, has changed significantly in the sense that the ball of wax is becoming much closer together at this stage of the game. Mr. Quarles, as you know, has been talking for some time about the fact we are in a technological race for survival.

Mr. MAHON. Of course.

Mr. WAGGONER. For this reason, as I see his position, he had three choices yesterday. He had the choice of going off in several directions which he did not want to do. He had the choice of recognizing that the August conditions which were with us at that time are still here; nevertheless, the position that he chose to take was that the August condition which we had, so far as expenditures are concerned, is still with us, but that the Defense Department is making a deep internal search of what it can do within the $38 billion budget, what it must do outside that, and until the picture is more clear he was just plain reluctant to talk about it. If he gave a picture of complacency it was completely in error, I assure you and the members of the committee.

NEED TO PROCEED WITH PROGRAMS

Mr. MAHON. We have the services here today, the people who want to get going, and it has been an entirely different climate. I have been very gratified with the hearing we have had. I am not speaking critically of the hearing of yesterday. All I want to do as an American and a public official is to get going with something in the light of recent conditions. I believe that is the attitude of you gentlemen here. I think it is very important that we get going. In a very

nonpartisan way I think that is the most important element here. I am very pleased to have you gentlemen before us, we all are. We are glad to note that you have faith and confidence and that you are ready to do the job, so good luck to you. We thank you very much.

Earth Satellite Program

Mr. Mahon. Admiral Bennett, we are pleased to have you here present for this meeting. We have been taking a reading on the status of the defense program. We thought while we were looking at the ballistic missile program, which is our chief concern, we ought to get a last minute report in regard to our earth satellite launching program.

Admiral Bennett. Since this committee has not too long ago heard the generalities of this program, I will go right into it and its present status.

1958 budget request

Mr. Mahon. This I would like to ask: You asked us for a transfer of $34 million, transfer authority. That was the budget request?

Admiral Bennett. Yes.

Mr. Mahon. Not a direct appropriation, but a request for transfer authority.

Admiral Bennett. Yes.

History of program

Now, Mr. Chairman, in reviewing the earth satellite vehicle program, I think a few historical facts, and very few, are necessary for perspective.

First, the general guidelines: we were to attempt to place a scientific satellite in orbit during the International Geophysical Year, that is, prior to December 31, 1958.

We were not to interfere with the missile programs. A secondary materials priority was the best obtainable for this reason.

Finally, the project was to be done economically.

Now, a few dates: On July 29, 1955, there was the White House announcement of the program.

On August 24, 1955, the Navy Research Laboratory was advised orally that the Navy would manage the Defense Department effort.

On August 25, 1955, prime-contractor negotiations began.

On September 9, 1955, the Secretary of Defense directive was written.

On September 23, 1955, less than a month later than the original oral notification, the prime contract was executed in broad terms.

In the following months much was accomplished on subsystems.

For example, in March 1956, General Electric began firing tests of first-stage engines.

Then, on March 29, 1956—and this is a key date—the revised basic-vehicle specifications were issued and the prime contract firmed up. That was on March 29, 1956.

On December 8, 1956, test vehicle zero was launched, proving the suitability of the launching complex and the data-acquisitions system.

On May 1, 1957, tests vehicle No. 1 was launched, proving the separation method, the stabilizing method, and the third-stage rocket performance in flight.

On July 15, 1957—and here is an interesting date—the test-vehicle schedule was revised to give minimum satellite flight at the earliest possible date, 6-inch tracking satellites, because of the success of the test vehicle No. 1. This was before sputnik.

On October 23, 1957, test vehicle No. 2 was tested satisfactorily, and that was the first-stage engine flight.

We are now approaching December. Test vehicle No. 3 is being checked out at the range. Test vehicle No. 4 is ready. The factory is ahead of schedule. Some of the tools are being stored, because satellite launching vehicle No. 6 is in manufacture.

With respect to test vehicle No. 3, as you may have seen in newspapers, the second-stage engine has been statically tested and the first-stage engine statically tested, both successfully. We are now in the final checkout period, getting ready to fire at a future date.

In conclusion, then, in about 2 years from the initiation of the project, and a little over a year and a half from the establishment of a specification, we reach December 1957 with a three-stage vehicle and a satellite being readied to test fire. I can find no missile project on the books, in any service, that has been carried so far so fast and so economically. That is the present status.

ADEQUACY OF FUNDS FOR VANGUARD

Mr. SHEPPARD. Insofar as the Vanguard is concerned, there has been no impairment of procedure because of lack of funds?

Admiral BENNETT. No, sir.

Mr. SHEPPARD. If additional funds had been granted, from your viewpoint, and from the scientific aspect, it could not have been materially increased from an efficiency and production point of view; is that correct?

Admiral BENNETT. I think that I would have to elaborate a little on that. If we had had more funds early in the program, there is always the possibility that it could have been expedited somewhat. I think Dr. Hagen, who is here, and Captain Horn, would agree that we really could not estimate how much, but possibly some. But, in the atmosphere of the days when we started this program, the schedule we were following was acceptable, and we were asked to do it economically.

EXPERIENCE OF NAVAL RESEARCH LABORATORY

Mr. SHEPPARD. What particular format of scientific experience was indicated when the Navy started the program originally?

Admiral BENNETT. I presume you are referring to the capabilities of the assigned laboratory.

Mr. SHEPPARD. That is correct.

Admiral BENNETT. The Naval Research Laboratory has been involved in scientific rocketry, large scale, since 1946, and this began with the V–2 firings which started shortly after the end of the war. I have the figures here. They are interesting. Sixteen V–2's, 14 Vikings—2 used as Vanguard test vehicles 0 and 1, and 46 Aerobees. It was because of these expensive experiments in the upper atmosphere rocketry, and particularly the instrumentation, that we believe the Navy was selected to do this program.

Mr. SHEPPARD. Insofar as the time element is concerned and the so-called success of launching the satellite pertains, from your statement I am interpreting that, with the possibility of a minor additional contribution of funds, everything has been done to expedite the launching of the satellite. Is that a reasonably correct statement on my part?

Admiral BENNETT. I would say that is a reasonably correct assumption; yes.

LAUNCHING DATE

Mr. SHEPPARD. What is the potential date again? You mentioned it.

Admiral BENNETT. For the next firing?

Mr. SHEPPARD. When you put it in the air.

Admiral BENNETT. The first-test, 6-inch satellite will go up sometime in December, we believe.

Mr. SHEPPARD. Either on or off the record, is it expected it will be in a competitive status with the one that has been launched by Russia?

Admiral BENNETT. I would like to go off the record on that.

(Discussion off the record.)

LAUNCHING OF LARGER SATELLITE

Mr. SHEPPARD. Taking into consideration the experience you have had in the field that we are discussing, what, in your opinion, would be the time element involved in putting one up such as we have been talking about, but which is still only in the experimental status?

Admiral BENNETT. I think that Dr. Hagen should make that estimate.

Dr. HAGEN. One could do things of value using the 21½-pound satellite that will go on the satellite-launching vehicles on Vanguard.

Mr. SHEPPARD. What is the background of scientific know-how that has been developed in this primary satellite that could be applied to the larger one?

Dr. HAGEN. That is why it is possible to say that one could do it in about 1 year, using the techniques that have been derived in Vanguard, but adding to it a booster that comes out of the IRBM program.

Mr. SHEPPARD. I have no further questions.

USE OF JUPITER-C TO LAUNCH SATELLITE

Mr. MAHON. If you had been allowed to use the Army's JUPITER-C missile system, could you have speeded up your program of actual launching?

Admiral BENNETT. There again I think I would like to refer that question to Dr. Hagen, since he is more familiar with the techniques.

Dr. HAGEN. It would depend somewhat upon the objective. If the objective had been to merely put something up there, and one had been satisfied with some 5-pound load, I think certainly the use of the JUPITER-C at the very beginning might well have resulted in a somewhat advanced date.

Mr. MAHON. You could have done it how much sooner?

Dr. HAGEN. It is difficult to say, but on the order of a few months, perhaps.

Mr. MAHON. Looking back in retrospect, might it have been good had we done that?

Admiral BENNETT. Yes, I think so.

Dr. HAGEN. Yes, if you acknowledge the tremendous psychological impact of simply orbiting a piece of metal. Certainly it would have been the wise thing to do.

Admiral BENNETT. It is all a part of the underestimation of the psychological aspects of this particular case.

Mr. MAHON. I did not feel, and do not feel now, it was my duty, or really the duty of the Congress at all, to evaluate and take action as a result of an evaluation of the psychological aspects of this thing. I do not know. Were you charged with any responsibility in that field?

Admiral BENNETT. No, sir; absolutely not.

PSYCHOLOGICAL EFFECT OF SOVIET SATELLITE LAUNCHING

Mr. MAHON. It seems to me that we would have people who are studying ways and means of keeping ahead in the battle for men's minds and that somebody would have come up with an analysis of what this would do to the world. It never occurred to me it would be so spectacular as it has proven to be. Did you realize what was going to happen when somebody launched a satellite?

Admiral BENNETT. From a scientific aspect, we certainly did.

Mr. MAHON. I am not talking about that.

Admiral BENNETT. That is what I am talking about. That is what really would have keyed the people who really get things done in this world on this satellite. If the first Russian satellite had been more scientific, the scientists and I, for example, would have felt much worse about it.

As to the plain psychological effect on people, that was out of my province, and I know not where in the Government it belongs.

Mr. MAHON. Most of us are influenced by the psychological impact that this thing flying around in space like a tiny little planet having been born on earth and launched in the upper atmosphere has created.

Admiral HAYWARD. The truth of the matter is there is really no place where we wage political warfare of this kind, where decisions like this are made. If it has to fall in the Department of Defense and they have to fight for military readiness and do the job tomorrow, a lot of times this pure propaganda and political warfare goes overboard. I will give you a good case in point.

Will you be upset when the Russians can fly an atomic-powered airplane?

Mr. MAHON. I do not think so very much right now, but when they fly it it may well develop I have miscalculated.

Admiral HAYWARD. The fact is we have been trying to get a Mach 3 airplane. There is no place in the Government where that decision is made for political or propaganda purposes as I can see.

Mr. SHEPPARD. You say that there is no place where those evaluations are made?

Admiral HAYWARD. For this particular program.

Mr. SHEPPARD. Whether it is for this program or any other program, I have been under the impression that the money we spend with the State Department for psychological warfare would be used in this field.

They are a component part of the Government even though they may not contribute to the military.

Admiral HAYWARD. It is not in the Department of Defense.

Mr. SHEPPARD. I will go along with that, but when you say the Government, that is all-inclusive.

Admiral HAYWARD. I will withdraw the Government. I am speaking of the Department of Defense.

Mr. MAHON. Dr. Hagen, did the launching of the first satellite turn out to be a more spectacular event than you had foreseen?

Dr. HAGEN. That is very difficult for me to answer. I think all of us who are in this business fully understood the truly great psychological advantage that would be obtained from doing it, so to that extent I would not be surprised at the public reaction. I think that I was astounded at the depth of that reaction.

REACTION IN OTHER COUNTRIES TO SOVIET SATELLITE

Mr. MAHON. It was not just a reaction among the scientists, it was the reaction among people of all ages regardless of their interest in scientific matters.

Dr. HAGEN. And I think again an important thing to remember is that the great reaction came from the people in this country rather than the people in other countries as far as I can gather from the letters from my friends.

Mr. MAHON. You think the reaction in this country was relatively more pronounced than in other countries?

Dr. HAGEN. That is correct.

Mr. MAHON. How do you interpret that?

Dr. HAGEN. Well, I think the reason for that is that we had gone along right blithely believing we were so far ahead of the Russians.

Admiral BENNETT. I concur.

Dr. HAGEN. It was a shock.

SOVIET SATELLITE AS STIMULUS TO UNITED STATES PROGRAM

Mr. SHEPPARD. I think the statement from both of you gentlemen is quite acceptable, but is not this somewhat of a pertinent factor—they say there is always good in a lot of bad things, and the reason this committee is assembled today is because of a concentration of interest that would not be prevalent had the satellite not been put up by the Russians.

Dr. HAGEN. That is correct.

Mr. SHEPPARD. The general aspect is pretty much the same when you evaluate the psychological reaction you are getting.

Dr. HAGEN. Putting it a different way, I think the Russians may have done us a favor.

Mr. MAHON. I do not doubt that.

ACCEPTANCE OF SATELLITE OVER FOREIGN COUNTRY

Admiral HAYWARD. There is another good that came out of it. There was a great discussion by people as to just what the reaction would be of a satellite flying over foreign countries. We were afraid

that the Russians would consider this an unfriendly act. For all practical purposes they have accepted it.

Mr. MAHON. Do not ever think that, Admiral. For the International Geophysical Year and 1 or 2 satellites, yes; but when you put up the reconnaissance satellites you are going to find it is a different story, in my opinion. Of course, we have a good basis for argument, but they have a good basis for argument too in that this was a Geophysical Year program and not a long-range program.

SOVIET SATELLITES AS PART OF INTERNATIONAL GEOPHYSICAL YEAR

Mr. SCRIVNER. Someone said that they decided that this was not the International Geophysical Year satellite that they were going to put up and that is the reason they did not give us information on the radio wavelength and what not. The IGY satellite is still yet to come.

Mr. MAHON. Do you mean to say that the Russians have admitted their satellite has nothing to do with the Geophysical Year?

Dr. HAGEN. Not today. There was in the very beginning a report from the Russians that the first satellite was simply a test and not a part of the Geophysical Year series, but they later retracted that statement and have included both of the satellites now in their Geophysical Year efforts.

Mr. OSTERTAG. They can certainly turn it on and off.

Mr. MAHON. Are there any questions?

TECHNICAL DATA FROM SOVIET SATELLITE

Mr. RILEY. How much technical information do you think the Russians have been able to obtain from the satellite? Is it very substantial or rather limited, in your opinion?

Dr. HAGEN. This is, again, presently difficult to answer. We do know that, of course, they have had telemetered information out of the satellite. It has not been in tremendous quantity. The Russians as adherents to the IGY are expected to turn over to the international IGY organization before too long the information that they did obtain during the flight of these spheres. It will be most interesting to see whether they do.

Mr. MAHON. Are there any questions on my left?

PRIORITY OF VANGUARD

Mr. WIGGLESWORTH. Admiral, you have already indicated that this project, as far as the military was concerned, was given a low priority lest it might interfere with our military missile program on which you were concentrating.

Admiral BENNETT. Not a low, but a secondary priority. In other words, it was not at the top. That is correct.

Mr. WIGGLESWORTH. Hindsight is easy, but from strictly a military standpoint there was a very definite danger that if it had a top priority it might have done just that thing; is that correct?

Admiral BENNETT. That is correct.

Mr. WIGGLESWORTH. That is all, Mr. Chairman.

Mr. MAHON. Mr. Scrivner.

FIXING OF SATELLITE LAUNCHING DATES

Mr. SCRIVNER. Admiral, I have gone back as far as I can in all of the hearings. There is one volume I cannot find on all of this IGY and the satellite undertaking. I recall that last year, when you were before the committee, you made some reference to the fact that the Navy—that is, yourself, the Navy part of the program—did not have anything to say about the fixing of the dates.

Admiral BENNETT. That is correct, sir.

Mr. SCRIVNER. Who was to fix the dates, then, if the Navy was not?

Admiral BENNETT. The dates were fixed as much as they were fixed by the Presidential announcement, which simply was that we would attempt a satellite within the International Geophysical Year. This fixes the end point date.

Mr. SCRIVNER. Let us hold that. Dr. Hagen, upon what information did the President make that statement? It had to come from somebody in the IGY setup or National Science Foundation, or somebody.

Dr. HAGEN. In agreeing to take part in the IGY in this way, the President discussed the matter with the National Science Foundation and the National Academy of Sciences, and it was the National Academy of Sciences, in conjunction with other scientific groups in Europe, that set up the dates of the IGY, but as we saw it the directive we had was to place a satellite in an orbit within the IGY.

Mr. SCRIVNER. As I understand it, and as I have gleaned from the hearings and the reports of the National Academy of Sciences and other sources of information, this was primarily a civilian scientific undertaking.

Admiral BENNETT. Yes, sir. I will answer that one. It was a scientific undertaking, within which the Navy was assigned the vehicle.

Mr. SCRIVNER. I will come to Navy next. I wanted an answer to that one question, that it was primarily a civilian scientific undertaking.

Admiral BENNETT. Yes, sir.

DESIRE OF NAVY TO OPERATE VANGUARD PROGRAM

Mr. SCRIVNER. There have been statements to the effect that it was almost necessary, and in common parlance, to sandbag the Navy into taking part in this program.

Admiral BENNETT. Mr. Scrivner, I cannot answer that because I was not here.

Mr. SCRIVNER. You are the top Navy man here.

Mr. MAHON. Let us ask the scientists.

Dr. HAGEN. To my knowledge, sir, I do not think that that statement would be entirely correct.

Mr. SCRIVNER. I did not think so, either, because ——— the Navy participated in ——— and they had been interested in any number of these things that would make it, to me, a very natural thing for the Navy to be called upon. Especially in view of the fact that the National Science Foundation was finding it just a little difficult to get as many millions of dollars as they found this thing was eventually going to cost them, much more than they had ever anticipated. At

any rate, as I understand it now the answer is that the Navy was not sandbagged into it, but that was right in line with much of the research work that they had been doing prior to this proposal.

Admiral BENNETT. That is correct.

Dr. HAGEN. That is quite right.

SCIENTIFIC VALUE OF SOVIET SATELLITE

Mr. SCRIVNER. Admiral, you made a statement that I do not think you quite completed, where you were referring to the Russian satellite and its scientific value. I could not quite follow it. My inference was it did not have as much scientific value as some people had thought that it had or would have.

Admiral BENNETT. With respect to the first one, sir——

Mr. SCRIVNER. That is the one I am talking about.

Admiral BENNETT. The first indications, even from the Russians, were that this was a test vehicle. ——— ——— I believe subsequently they announced that they had at least one experiment in this vehicle in respect to their stated purpose to carry out certain scientific experiments. Even one, I believe, would be considered to be somewhat disappointing scientifically.

Mr. SCRIVNER. So that, as far as pure science is concerned, getting away from psychological aspect and all that, it was not particularly important?

Admiral BENNETT. No, sir. I would not think so. I would describe it as a test satellite.

Mr. SCRIVNER. Would it be logical to assume that probably the one primary bit of information they got was the heat?

Admiral BENNETT. I would ask Dr. Hagen to concur, but I believe it probably was temperatures.

Dr. HAGEN. That is right.

TRACKING OF ORBIT

Mr. SCRIVNER. Once the radio beams cease how difficult is it to then track the orbit of either the first one or the second one?

Admiral BENNETT. The answer to that, I think, would lie in how accurately you had been able to figure out the orbit before that point because after that the computers can keep on running, and presumably the astronomers would still be able to keep on the satellite.

Mr. SCRIVNER. In other words, it is coming back at a fairly constant rate?

Admiral BENNETT. Yes, sir.

Mr. SCRIVNER. So that, despite the fact that we are no longer getting any radio information, you could, in your tracking stations, now establish a fix on it?

Dr. HAGEN. Yes. We can predict when it will come over or when it does come over and when it will come again in twilight.

Admiral BENNETT. This will be the optical tracking services which are run by the Smithsonian Institute.

BOOK ON SATELLITES

Mr. SCRIVNER. Yes; it would have to be optical. Have you had an opportunity to read this book?

Admiral HAYWARD. It is an excellent book. It gives you lots of very good information.

Mr. SCRIVNER. As a matter of fact, I have not quite completed it. I have been somewhat surprised at some of the things I read in here, because some of them are things that even our committees had not been told; maybe because we did not ask the questions. But many things are here, going back into the very history of the program and yet this was prepared, copyrighted in 1956, and this paperbacked volume was just published about a month ago. I just picked it up in Kansas City a week ago. (The book referred to is "Satellite," by Erik Bergaust and William Beller).

Admiral HAYWARD. It is a good book.

Mr. SCRIVNER. Anybody else in the United States who can read can now become a satellite expert in almost 24 hours' time. You do not have to worry about the great progress that the Russians have made in their University of Moscow. Here it is. You really think this is a good publication?

Admiral HAYWARD. Yes, sir.

Mr. SCRIVNER. In 1 or 2 places somebody did not tell them everything, for which I am quite thankful, but it seems on the whole to be a pretty concise and fairly accurate booklet.

Admiral HAYWARD. That gives you the best statement on solid and liquid propellents. It tells you the mass weight ratios and why you go to the liquid, if you want to get the exhaust velocity.

Mr. SCRIVNER. Some of that has been in our hearings. When we do that, somebody over in Russia does not have to sit down in a laboratory and figure it out. We have told them.

Admiral HAYWARD. That is right.

Mr. SHEPPARD (presiding). Mr. Ford?

MILITARY RECONNAISSANCE SATELLITE

Mr. FORD. Admiral, I think this committee is interested in the satellite program, but in the long pull our prime responsibility is the military application of the satellite program, which I understand primarily is a military reconnaissance satellite of some sort. What is your opinion of that, as to the feasibility, time element, and so forth?

Admiral BENNETT. I do not believe there is any doubt, sir, that any satellite program is bound eventually to head toward a military reconnaissance vehicle of some kind. As to time, I think the simple and accurate answer to that is, it all depends on how badly you want to do it, what is your use for it and how much money you are willing to spend on it.

Mr. FORD. In general, are we in a position where we can really go forward on one at the present time?

Admiral BENNETT. As a generality, I believe so, fairly shortly, sir.

Mr. FORD. How soon would we come up with something that would be practical from a military point of view, even in the beginning stages?

Admiral BENNETT. I think perhaps Dr. Hagen is better qualified to answer that. I think he partly answered it a minute ago.

Dr. HAGEN. Yes. If money and priority were put behind the project, you could do it within about 1 year. This is not a big, 2-ton

object. It will weigh three to five hundred pounds, but it would be capable of doing a part of the reconnaissance problem.

Mr. FORD. Do you know what is the status today of our military reconnaissance program, whether Army, Navy, or Air Force?

Admiral HAYWARD. Off the record.

(Discussion off the record.)

CHANGES IN VANGUARD PROGRAM

Mr. FORD. What significant changes, if any, have been made in your program, Admiral Bennett, since the last session of this committee?

Admiral BENNETT. No significant changes, sir. This follows from the fact that, for example, it has not been possible to expedite it very much. The one thing that I can think of offhand that would be regarded as significant is the one I mentioned in July where, due to the early success with one of the vehicles we decided to try a test satellite, small size, at the forthcoming firing.

Mr. FORD. Are there any significant changes you anticipate before you finish your job?

Admiral BENNETT. Not within this particular program; no, sir. It is too far down the road to make any very significant change in it. As you will recall a month ago, I testified that the last launching vehicle was already in production and in fact part of the tooling had already been started.

KEEPING SATELLITE IN FIXED POSITION IN RELATION TO EARTH

Mr. FORD. Dr. Hagen, since Sputnik I lots of people have been interested in what the Congress knew about this program. Fortunately I had some volumes home of the hearings we had and I got them out and looked through them. One of the quotations which I use from time to time in groups was the one that appeared on 894 of your testimony on February 28, 1957. Several people asked me how this happened. I will read it to you and if you will tell me, then I can better answer them if I am ever questioned again. I am no scientist. Here is what you said. I am sure there is a quick answer, I would like to have it.

You said:

> If the satellite were put 22,000 miles above the surface of the earth, then its period around the center of the earth would be exactly 1 day. That means if you should launch it at some point on the Equator you could keep it over your head for an indefinite period of time.

Tell me why that happens.

Dr. HAGEN. Well, the quick way of doing that is this: You have now seen what a close-in satellite does. It goes around the earth 15 or 16 times a day. If you go out as far as the moon, it takes the 27 days, so somewhere in between there is the crossover point where it would take it just 1 day to go around the earth.

The motion of the satellite is independent of the spinning of the earth on its axis so the satellite is going around at a rate of 1 day, the earth itself is spinning at a rate of 1 turn a day, and so it is always over your head.

Mr. FORD. The fact that it is that much further away from the surface of the earth and going that much faster than the spinning of the earth keeps it at one point?

Dr. HAGEN. That is exactly correct.

Mr. FORD. That is 22,000 miles.

Mr. OSTERTAG. Two things go in opposite direction at the same speed?

Dr. HAGEN. You would make them go in the same direction. You would launch in the direction in which the earth is rotating.

Admiral CLARK. You would be the hub of the wheel and it would be at the end of one of the spokes.

APOGEE AND PERIGEE OF SATELLITES

Mr. FORD. On page 885 of the hearings, you talked about the perigee and the apogee.

Dr. HAGEN. Yes, sir.

Mr. FORD. Has that been the experience you have had in observing the Sputnik I and Sputnik II?

Dr. HAGEN. Both Sputniks I and II had perigees, which were probably smaller than the perigee that we expect to get. Also, the apogees are not quite as large. Their orbits are closer in than we expect to have for our satellite. The numbers run something like 150 miles for the Russian closest approach, 550 for Sputnik I on the far away and about 1,100 for Sputnik II. We expect our closest approach to be not under 200 miles, and the furthest approach, separation, to be between 1,100 and 1,500, so that our orbit will be somewhat bigger than the Russian, and will not come in so close. We do that so that it will stay up in the air a longer time.

APPRAISAL OF SOVIET SATELLITE ACHIEVEMENTS

Mr. FORD. From a scientist's point of view, were you surprised or amazed at the fact that they had progressed so far?

Dr. HAGEN. I was amazed to learn that they had that much capability in the ballistic-missiles field; yes. I do not believe that their technology in instrumenting the satellites in any way compares with what we are capable of in this country. They had a tremendous amount of weight there, and the amount of information that seems to come out is not commensurate with the weight that they put in the air. I think you will find, if we wait until the end of the IGY and then take stock, and tally up the scientific benefits that come out of the Russian program and the scientific benefits that come out of the American program, we should be ahead, even though, in total mass, we will have put up less weight. But it will be so much better instrumented that we should get more scientific information. That remains to be seen, however.

SOVIET COOPERATION WITH INTERNATIONAL GEOPHYSICAL YEAR

Mr. OSTERTAG. Let me pick up the point you made and ask if you believe that by the end of IGY you will have an honest report on the thing or have you gleaned from what they have already done the true factors in the matter?

Dr. HAGEN. We can only wait and see. We know in some of the other IGY programs they have done some reporting. So there is an indication that they will play it straight from a scientific point of view, but you cannot be sure until you let the time go by and give them a chance.

Mr. OSTERTAG. Have they played it straight from the inception of the satellite project business? Have you people had the information?

Dr. HAGEN. No, sir.

Mr. OSTERTAG. Was that not a violation of the whole basic agreement in the launching of the program?

Admiral BENNETT. Could I answer that? I think the answer is contained in a press interview that I believe was held last Friday. The Washington papers quoted their leading man, Gonrorovov, in this press interview as saying they had no intention of announcing the next satellite. Later in the article he said "Why should we announce it? There is no one interested in an unsuccessful try." According to my interpretation, he inferred in his statement that in the IGY we are only required to announce the successful ones.

INFORMATION GAINED FROM SOVIET LAUNCHINGS

Mr. OSTERTAG. Dr. Hagen, have we learned from this experience on the part of Russia anything that will be beneficial or shed light in connection with your objective?

Dr. HAGEN. We have learned something from their efforts. There are two kinds of experiments you can do with satellites. One of them depends entirely upon tracking. You can do that with anybody's satellite. You learn something about air densities. If you can track the thing for a long enough time you can learn things about the geodesy, shape of the earth, things of that nature.

We have learned a lot through tracking these satellites. We have also learned a lot about the operation of our own tracking and orbit computation capabilities. These things we would have had to do in a dry-run fashion for our own satellite in any event.

RESPONSIBILITY FOR LAUNCHING UNITED STATES SATELLITE

Mr. OSTERTAG. Admiral Bennett, you responded to a question Mr. Scrivner asked to the effect that you make the decision as to when the launching will take place. Is that correct?

Admiral BENNETT. That is correct.

Mr. OSTERTAG. Do you mean the Defense Department or the Navy?

Admiral BENNETT. It will have to be the Navy because we are the ones responsible for the launching.

Mr. OSTERTAG. I wanted to make clear it was not a Defense Department decision but rather the Navy as the assigned agency responsible for the project itself.

Admiral BENNETT. They could tell us not to launch it, but they could not tell us to launch it.

Mr. OSTERTAG. As a result of Sputnik I and II, have you people automatically stepped up your program? Are you working harder? Are you stepping up the dates for your tests and also for your contemplated schedule?

Admiral BENNETT. We have been stepping them up as much as possible. You will recall a moment ago as I said we were so far along the line of this particular development, that it has not been possible to step it up much. Everyone is trying his best to expedite, but this cannot be very much.

VANGUARD COMPARED WITH SOVIET SATELLITE

Mr. OSTERTAG. There has been considerable publicity about project Vanguard and how it compares with the Russian achievement. Would you say that there is a possibility if you are successful that a comparison can be made and that we will still be far behind insofar as measurement of success?

Admiral BENNETT. I think only on a scientific basis, because we will not have access to one simple fact which would be essential if I gather your meaning. That is, when did they start? As I said earlier this afternoon, we have had a certain time scale to get as far as we have gotten. We will have a certain time scale until we finish. We know when they got their first one up, but do not know when they started.

Mr. OSTERTAG. Vanguard will be just a small sphere and will probably have certain limitations as to what it will do. Is that correct?

Admiral BENNETT. That is correct, sir.

Mr. OSTERTAG. In other words, will you get as much out of Vanguard as they have obtained out of Sputnik II, let us say?

Admiral BENNETT. I doubt if we could put a dog in the Vanguard satellite. We might put a small animal. As Dr. Hagen said a minute ago, we may be able to show at the end of the program that we have gotten more from these small ones.

Mr. OSTETRAG. It will not be until the end of IGY that a true evaluation can be made by comparison. Is that right?

Admiral BENNETT. I believe so.

Mr. SCRIVNER. You will be able to make some comparisons.

Admiral HAYWARD. It is unclassified.

Mr. SCRIVNER. I mean ours is unclassified and theirs has been.

Admiral HAYWARD. The scientists in the years to come will quickly see who got the best scientific information. I am sure this will come out.

AWARENESS OF SOVIET EFFORTS

Mr. SCRIVNER. Were you people aware of the progress that they have been making and that they were ready to go? They made certain announcements to begin with; did they not?

Admiral BENNETT. No, sir. We were not particularly aware. They had made, I believe, two general announcements at these international meetings that they would also launch a satellite, but, as far as I know, the first quasi-official Russian information on the launching was contained in a Russian magazine published in June. This was instructions for their amateur observers as much as anything. But we did not have a full and open disclosure of their plans in anything I have ever seen or heard of.

Mr. SCRIVNER. You were not aware, nor did you move toward changing your schedule that was established.

Admiral BENNETT. That is correct, sir.

Mr. OSTERTAG. First, I wondered whether we had such knowledge and, if so, will it have any bearing on what we do or how we scheduled the program?

Admiral BENNETT. I would say no, sir.

VIEWS OF CONGRESSMAN MAGNUSON ON VANGUARD PROGRAM

Mr. MAHON. Congressman Magnuson, of Washington, a member of this committee, called me on the telephone and asked that I make some inquiries in regard to his concern or misgivings with respect to the Vanguard program. I believe I made that material available to you.

Admiral BENNETT. That is correct.

Mr. MAHON. Will you comment on that, please?

Admiral BENNETT. Yes, sir; be glad to. It was quite an epistle that he wrote, Mr. Chairman.

The communication you refer to was written, I am sure, out of concern for the national interest and with an intent to be constructive. However, it contains information that is incorrect, errors of fact, misinterpretations, and misunderstanding. I will take up the points covered as briefly as possible in an orderly manner, as follows: Organization, planning, technical points, and miscellaneous.

VANGUARD ORGANIZATION AND PLANNING

Under organization and planning, about which he expressed some qualms, it is obvious that the chain of authority runs from the Secretary of Defense through the Secretary of the Navy, and the Chief of Naval Research, to the Director, Naval Research Laboratory. Within the Laboratory, Vanguard is a division. I will show you a chart to illustrate that.

Mr. MAHON. Off the record.

(Discussion off the record.)

Admiral BENNETT. Within the Laboratory, Vanguard is a division. I have the chart here to show that.

Mr. MAHON. We will accept that.

Admiral BENNETT. Here is the position chart. Here is the named person's organization chart. Here is the chart of organization of the operations group at Patrick Air Force Base. This happens to be that particular one.

The Vanguard organization is augmented by support from the rest of the Naval Research Laboratory. The prime contracting, in a business sense, is done by the contracting officer in my office. There is an able group of officers in Vanguard; for example, aeronautical engineers, for contract administration, as project officer, and so forth. At the contractor's plant, the Bureau of Aeronautics representative and his mixed military/civilian staff cover inspection. Navy inspection service covers the subcontractors' plants.

This is a far cry, indeed, from the idea that an uncoordinated handful of individualistic scientists are going off in all directions.

Mr. FORD. Was that the statement made in the newspaper?

Admiral BENNETT. This was the sense of a lot of words; yes, sir. Now, as to planning, here is the master plan for Project Vanguard,

administrative and technical. We have it here, and I could read you numerous of the items; we have the requirements on the missile center. These are some of the plans.

Mr. MAHON. No wonder the Russians beat us.

Admiral BENNETT. Everything moves on paper. Perhaps this is enough on organization and planning, although we have more information if you like.

Mr. MAHON. Off the record.

(Discussion off the record.)

SUPERVISION OF CONTRACTORS

Admiral BENNETT. He makes a point about supervision of contractors. Before going on to technical matters, this committee knows a prime contractor is paid to run his show, and he must do so. The Government cannot take over.

Shortly after the start of the Vanguard contract, the Martin Co. undertook TITAN. As a result, some of the old Viking team was transferred to TITAN. This caused temporary concern simply because we did not know all of the new people. We were assured that the talent was first flight management, and this is the case.

As to the Navy, I myself have periodically conferred with Martin management and striven to impress them with urgency, the last time less than a month ago. There was a question of the competence of the managers in an industrial sense.

The Director of the Naval Research Laboratory, Captain Horn, here today, an experienced engineer officer, has spent a great deal of his time on this project.

TECHNICAL DIFFICULTIES

Now as to technical matters: First of all, there is a misunderstanding here as to difficulty. It is the early stages of a development that are difficult and troublesome—not the later. It is early that "bugs" pop out. Later, no matter how complex the device, everything becomes more or less routine. Thus it is that the test vehicle series is crucial.

The technical difficulties can be divided into two groups: those that can be foreseen; those that cannot. I will use his own examples. Foreseeable. This is the question of backups. From the beginning there has been an alternate third stage engine. The budget from the beginning included funds for backup first- and second-stage engines—they were not required. There has always been a backup for the inertial guidance system built into the vehicle in the form of a ground radar tracking computing guidance. The Navy had to furnish the advanced radars for this system since the Air Force range did not have radars of high enough performance for the task. A steel backup chamber for the advanced design aluminum second-stage engine was carried along until it was seen not to be necessary. The structural feedback problem—there was a question raised as to whether vibrations in structures had delayed the program.

The structural feedback problem which has plagued most missile programs was recognized early in our program and was completely solved prior to the time of the delivery and flight of the first full Vanguard configuration.

The statement that vehicle TV–1 was held at the range because of a lack of range safety and trajectory data is not correct. The vehicle was prepared for launching and launched immediately after the receipt of the nose cone at AFMTC. The date of the launching of this vehicle in no way affected the date of the launching of the next vehicle TV–2. It should be pointed out that many trajectory and dispersion data had to be calculated as a part of the design procedure for the TV–1 nose cone. The flight of the vehicle TV–1 was entirely successful and proved the adequacy of spin stabilization of the third stage and nose for final guidance of the vehicle, as well as third-stage engine performance. This I talked to the committee about last spring.

There is some misunderstanding as to guidance accuracy of 2 seconds of arc and plus or minus 1 foot-second for success. Vanguard can tolerate 1½° of inaccuracy, and we are deliberately exceeding the minimum velocity by 1,500 foot-seconds for orbital safety margin.

Unforeseeable: The first-stage engine at one point ran into burnout difficulties, after much successful testing. As I have previously told this committee, the trouble was quality control—inspection if you like—of a small but essential part.

The second-stage engine at one point had tankage failures. A change in metal processing cured this defect. In the meantime, tankage from another contractor was obtained, tested and is on hand if needed.

When TV–2 was received at AFMTC, dirt was discovered in the system. This took time to clean out because such complex systems must be absolutely clean. A human failure somewhere. Cure—even more inspection.

MISCELLANEOUS

Miscellaneous: There is a statement that an "old" engine was used. In a development things are reworked and reused all the time. Would you junk your "old" Cadillac engine because a valve burned out?

This is not a "large production contract." There are 14 vehicles. Let us look at NRL's experience in rocket firings. I have already given the figures.

Mention is made of the Committee on Special Capabilities. This committee has always had the factual picture. It has met almost once a month. In over 20 years of research and development I have had some largish projects myself. I have never known of a project which had as many kibitzers as Vanguard.

EFFECT OF FAILURE OF SINGLE COMPONENT

The statement is made and I quote: "The failure of one small relay can upset a whole firing operation and result in a failure." This is 100 percent correct, and I only wish everyone understood this fact. This is why testing must be orderly and elaborate. This is why no one can possibly guarantee a given vehicle will perform. But this is true of other things, of home furnaces—of airplanes.

I would like to take about a half minute to tell you a personal experience in an airplane. About 3 years ago I had occasion to go from Panama City, Fla., to Jacksonville and come north from Jacksonville. At Jacksonville the connecting plane was delayed because of mechanical difficulty. We sat there and waited an hour and

three-quarters. We got in the plane and came into National Airport. Very nice flight. Everything functioned perfectly. I had hardly gotten home and gotten my feet under the table when the radio announced that plane had crashed at Newark, killed everybody in it and a lot of other people. That is the famous Newark crash that touched off closing the airport. Why? Two small wires and one propeller control had rubbed together, in other words, one relay. It is this very fine margin that you and I depend on in all our complex living.

I agree with the gentleman. One relay fails, we probably flub the flight.

Mr. SCRIVNER. He says there is just a relatively simple rocket which does not approach the complicated rocket needed to launch the satellite.

Admiral BENNETT. He is incorrect in that. It is the early so-called simple ones that are tough. When you get it all together you have checked everything and it becomes easier.

Mr. SCRIVNER. I raised that just to ask a question as to whether you answered that fully or not.

Admiral BENNETT. I thought I did, sir. In explaining it was the early ones that are hard.

Mr. SCRIVNER. That particular statement?

Admiral BENNETT. Yes. That is all there is.

I feel Vanguard is a well managed, properly handled development project proceeding according to plan. We will do our best to put satellites in orbit as directed.

Mr. MAHON. The committee will adjourn.

WITHHOLDING OF FUNDS TO REMAIN WITHIN $38 BILLION LIMITATION

(The following information was submitted in response to the question of Mr. Mahon on p. 82:)

JANUARY 13, 1958.

Hon. GEORGE H. MAHON,
Chairman, Subcommittee on Department of Defense Appropriations,
House of Representatives.

DEAR MR. MAHON: This is in answer to your request of November 20, 1957, during hearings on the missile program for a statement of all funds withheld from the Army in connection with the attempt to stay within the $38 billion expenditure ceiling for the Department of Defense.

On August 13, 1957, the Department of the Army was notified that its approved expenditure ceiling for fiscal year 1958 was $8.95 billion. This compares with the total estimated expenditures of $9.17 billion initially included in the President's budget for fiscal year 1958. The expenditure target was subsequently revised to $9.043 billion due to acceleration of the Jupiter program.

The attached tabulation compares the OSD financial plan (revised to conform with the fiscal year 1959 President's budget) with the fiscal year 1958 obligational program authorized by Congress. This tabulation, expressed in terms of direct obligations, shows a net decrease in the financial plan total from that presented to the Congress of $118 million. You will note, however, that the DOD financial plan provides for an increase in the obligational program under two appropriations. These are described below:

Procurement and production appropriation: The increase of $80 million is for Jupiter funding.

Research and development appropriation: The increase of $57 million represents primarily transfers from the OSD emergency fund for Jupiter and certain programs which are controlled by the Office, Secretary of Defense, and are outside the basic Army research and development programs.

I trust that this information will be of value to you.

Sincerely yours,

DAVID W. TRAUB,
Major General, GS,
Director of Army Budget.

Department of the Army fiscal year 1958 status of funds—Direct obligations

[Millions]

	Authorized by Congress	OSD financial plan	Difference
Military personnel, Army	$3,513	$3,468	−$45
Operation and maintenance, Army	3,320	3,158	−162
(Includes deutschemarks)	(105)	(41)	(−64)
Procurement of equipment and missiles	1,394	[1] 1,474	+80
Research and development	[2] 400	[3] 457	+57
Army National Guard	334	327	−7
Reserve personnel, Army	207	203	−4
Military construction, Army	350	341	−9
(Includes deutschemarks)	(0)	(1)	(+1)
Military construction, Army Reserve Forces	55	27	−28
Others	6	6	0
Total	9,579	9,461	−118

[1] For comparability excludes $100 million representing deobligations; the $1,394 authorized by Congress is not of deobligations.
[2] Includes $372 million for Army program.
[3] Includes $409 million for Army program.

DECEMBER 6, 1957.

Hon. GEORGE H. MAHON,
Chairman, Department of Defense Subcommittee,
House Appropriations Committee, Washington, D. C.

MY DEAR MR. CHAIRMAN: During the hearings held November 21, 1957, you requested each service to furnish a statement of all funds withheld in connection with the attempt of the Government to stay with the $38 billion level. In response to your request, the following information is submitted. Enclosures (1), (2), (3), and (4) are furnished in connection with the subject matter.

As noted in enclosure (1), $79.2 million of the Department of the Navy annual funds was placed in reserve. Subsequent to placing these funds in reserve $11.4 million was transferred to the Department of Defense United States Scientific Satellite appropriation for project Vanguard. At the present time, consideration is being given to the transfer of additional funds to the Department of Defense emergency fund for the acceleration of the Polaris project.

Enclosure (2) provides the normal letter of guidance for the control of funds prior to passage of the appropriation act and the receipt of the initial apportionment. Enclosures (2) and (3) established limitations for obligations and commitments for fiscal year 1958 for nine annual accounts which reflect adjustments for the reduction in personnel strength. Apportionments approved by the Bureau of the Budget and returned to the Department of the Navy were for 6 months and were compatible with enclosure (3).

In connection with the procurement accounts, namely, "Aircraft and related procurement, Navy," "Procurement of ordnance and ammunition, Navy," "Marine Corps procurement," and "Shipbuilding and conversion, Navy," the Bureau of the Budget approved apportionments on an interim basis, less than 6 months, and limited the commitment authority to the amounts outstanding as of June 30, 1957. In addition, the Office of the Secretary of Defense, prior to the approval of the Navy's initial apportionment, prohibited obligations against prior year commitments except as specifically authorized by that Office on a line item basis.

As of November 25, 1957, the Department of the Navy has received approved apportionments in the above-noted procurement accounts totaling $3.65 billion in contrast to a total planned apportionment program of $4.38 billion, as reflected in enclosure (1). As of December 4, 1957, the Department of the Navy has submitted requests for apportionment of the entire fiscal year 1958 obligation and commitment plan. It is anticipated that full apportionment will be received in December.

The information in this letter is not classified. However, this letter has been given a classification of "confidential," since it is in reply to a request made in executive session. This letter may be downgraded to "unclassified" when the information is released by your committee.

I trust that the information outlined above meets your request.

Sincerely yours,

W. G. COOPER,
Rear Admiral, USN, Deputy Comptroller.

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations

[Thousands of dollars]

Appropriation title	Funding analysis of unobligated balance brought forward		Resources available for obligation in fiscal year 1958						
	Appropriations, reimbursements earned, and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1957	Total unobligated balance brought forward into fiscal year 1958 (cols. 2+3)	Fiscal year 1958 appropriations	Transfers and rescissions	Anticipated reimbursements based on orders to be received in fiscal year 1958			Total obligational availability (cols. 4+5+6+9)
						From fiscal year 1958 MAP common item orders [2]	From all other sources	Total anticipated reimbursements from new orders	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
OFFICE OF SECRETARY OF DEFENSE									
General fund accounts:									
Salaries and expenses, OSD				15,900					15,900
Salaries and expenses, OPA				450					450
Claims				12,000					12,000
Construction of ships, MSTS	10,255		10,255						10,255
Contingencies				30,000					30,000
Emergency fund				85,000	−38,650				46,350
Retired pay				555,000					555,000
Salaries and expenses, Court of Military Appeals				375					375
United States scientific satellite					34,200				34,200
Subtotal	10,255		10,255	698,725	−4,450				704,530
Access roads	2,027		2,027						2,027
Family housing	3,311		3,311						3,311
Loran stations				5,500					5,500
Total, Office of Secretary of Defense	15,593		15,593	704,225	−4,450				715,368

See footnotes at end of table, p. 132.

23795—58——9

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations—Continued

[Thousands of dollars]

Appropriation title	Funding analysis of unobligated balance brought forward		Resources available for obligation in fiscal year 1958						
	Appropriations, reimbursements earned, and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1957	Total unobligated balance brought forward into fiscal year 1958 (cols. 2+3)	Fiscal year 1958 appropriations	Transfers and rescissions	Anticipated reimbursements based on orders to be received in fiscal year 1958			Total obligational availability (cols. 4+5+6+9)
						From fiscal year 1958 MAP common item orders [2]	From all other sources	Total anticipated reimbursements from new orders	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
DEPARTMENT OF THE ARMY									
General fund accounts:									
Military personnel				3,113,000	400,000		175,000	175,000	3,688,000
Operation and maintenance	21,830	63,163	84,993	3,215,000			283,852	283,852	3,583,845
Procurement and production	1,127,855	468,036	1,595,891				156,000	156,000	1,751,891
Military construction, Army Reserve Forces	28,076		28,076	55,000					83,076
Reserve personnel				197,000	10,000		500	500	207,500
Army National Guard				333,800			800	800	334,600
Research and development	33,828		33,828	400,000	38,650		3,000	3,000	475,478
Promotion of rifle practice				250					250
Operation and maintenance, Alaska Communication System, Army, 1957–58 and 1958–59	35		35	5,500			99	99	5,633
Construction, Alaska Communication System	857		857						857
Subtotal	1,212,482	531,198	1,743,680	7,319,550	448,650		619,251	619,251	10,131,131
Military construction	161,262		161,262	310,000			10,000	10,000	481,262
Total, general fund accounts	1,373,743	531,198	1,904,941	7,629,550	448,650		629,251	629,251	10,612,392
Special fund account: Preparation for sale or salvage of military property				23,000					23,000
Total, Department of the Army	1,373,743	531,198	1,904,941	7,652,550	448,650		629,251	629,251	10,635,392

DEPARTMENT OF THE NAVY										
General fund accounts:										
Military personnel, Navy				2,295,000	190,000		32,359	32,359	2,517,359
Reserve personnel, Navy				86,000			200	200	86,200
Navy personnel, general expenses		3,994	3,994	87,000			4,430	4,430	95,424
Military personnel, Marine Corps				630,000			6,582	6,582	636,582
Reserve personnel, Marine Corps				23,200			1,823	1,823	25,023
Marine Corps procurement	374,934	12,198	387,132						387,132
Marine Corps troops and facilities		4,068	4,068	178,000			5,893	5,893	187,961
Aircraft and related procurement	1,671,625	118,638	1,790,263	1,837,000		−10,000	5,000	−5,000	3,622,263
Aircraft and facilities				853,500		10,000	35,641	45,641	899,141
Shipbuilding and conversion	942,031	13,876	955,907	1,584,000			12,227	12,227	2,552,134
Ships and facilities		6,006	6,006	820,000			24,380	24,380	850,386
Procurement of ordnance and ammunition	113,371	44,041	157,412	176,000			53,655	53,655	387,067
Ordnance and facilities				164,000			6,700	6,700	170,700
Medical care				85,200			22,635	22,635	107,835
Civil engineering		4,528	4,528	134,630			48,798	48,798	187,956
Military construction, Naval Reserve Forces	25,725		25,725						25,725
Research and development	22,725		22,725	505,000			21,439	21,439	549,164
Servicewide supply and finance		748	748	300,000			12,615	12,615	313,363
Servicewide operations				107,000			5,927	5,927	112,927
Naval petroleum reserves				825					825
Subtotal	3,150,412	208,095	3,358,507	9,866,355	190,000		300,304	300,304	13,715,166
Military construction	177,927		177,927	265,000			5,000	5,000	447,927
Total, general fund accounts	3,328,339	208,095	3,536,434	10,131,355	190,000		305,304	305,304	14,163,093
Special fund accounts:									
Preparation for sale or salvage of military property				12,000					12,000
Ships' stores profits	2,303		2,303	8,100					10,403
Total, Department of the Navy	3,330,642	208,095	3,538,737	10,151,455	190,000		305,304	305,304	14,185,496
DEPARTMENT OF THE AIR FORCE									
General fund accounts:									
Aircraft and related procurement	3,645,856	910,990	4,556,846	5,886,000			38,000	38,000	10,480,846
Procurement other than aircraft	−22,940	445,069	422,129	1,171,500	−21,500		50,000	50,000	1,622,129
Operation and maintenance		9,336	9,336	4,092,120			235,214	235,214	4,336,670
Military personnel				3,801,600			26,253	26,253	3,827,853
Research and development	76,600		76,600	661,000			6,436	6,436	744,036
Reserve personnel				55,000					55,000
Air National Guard				263,000			126	126	263,126
Subtotal	3,699,516	1,365,395	5,064,910	15,930,220	−21,500		356,029	356,029	21,329,660
Military construction	367,012		367,012	900,000			8,000	8,000	1,275,012
Total, general fund accounts	4,066,527	1,365,395	5,431,922	16,830,220	−21,500		364,029	364,029	22,604,672
Special fund accounts: Preparation for sale or salvage of military property				10,000					10,000
Total, Department of the Air Force	4,066,527	1,365,395	5,431,922	16,840,220	−21,500		364,029	364,029	22,614,672

ee footnotes at end of table, p. 132.

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations—Continued

[Thousands of dollars]

Appropriation title	Funding analysis of unobligated balance brought forward		Resources available for obligation in fiscal year 1958						
	Appropriations, reimbursements earned, and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1957	Total unobligated balance brought forward into fiscal year 1958 (cols. 2+3)	Fiscal year 1958 appropriations	Transfers and rescissions	Anticipated reimbursements based on orders to be received in fiscal year 1958			Total obligational availability (cols. 4+5+6+9)
						From fiscal year 1958 MAP common item orders [2]	From all other sources	Total anticipated reimbursements from new orders	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
DEPARTMENT OF DEFENSE									
General fund accounts:									
All accounts except military construction	8,072,665	2,104,688	10,177,353	33,814,850	612,700		1,275,584	1,275,584	45,880,487
Military construction accounts	711,538		711,538	1,480,500			23,000	23,000	2,215,039
Subtotal	8,784,203	2,104,688	10,888,891	35,295,350	612,700		1,298,584	1,298,584	48,095,525
Special fund accounts	2,303		2,303	53,100					55,403
Unidentified source of transfer for United States satellite					−34,200				−34,200
Grand total, Department of Defense	8,786,506	2,104,688	10,891,194	35,348,450	578,500		1,298,584	1,298,584	[4] 48,116,728

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations

[Thousands of dollars]

Appropriation title	Planned apportionment program					Unobligated balance expiring for obligation on June 30, 1958	Unobligated balance available in fiscal year 1959			Funding analysis of unobligated balance available in fiscal year 1959	
	Planned obligations			Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Total planned apportionment program for fiscal year 1958 (cols. 13+14)		Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Reserved in fiscal year 1958 for carryover into fiscal year 1959	Total unobligated balance available in fiscal year 1959	Appropriations, reimbursements earned and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1958
	For service account (direct obligations and unobligated portions of letters of intent)	For customer orders	Total obligations								
(1)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
OFFICE OF SECRETARY OF DEFENSE											
General fund accounts:											
Salaries and expenses, OSD	15,900		15,900		15,900						
Salaries and expenses, OPA	450		450		450						
Claims	12,000		12,000		12,000						
Construction of ships, MSTS	3,500		3,500		3,500	6,755					
Contingencies	30,000		30,000		30,000						
Emergency fund	36,350		36,350		36,350	10,000					
Retired pay	555,000		555,000		555,000						
Salaries and expenses, Court of Military Appeals	375		375		375						
United States scientific satellite	34,200		34,200		34,200						
Subtotal	687,775		687,775		687,775	16,755					
Access roads	2,027		2,027		2,027						
Family housing	3,311		3,311		3,311						
Loran stations	5,500		5,500		5,500						
Total, Office of Secretary of Defense	698,613		698,613		698,613	16,755					

See footnotes at end of table, p. 132.

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations—Continued

[Thousands of dollars]

Appropriation title	Planned apportionment program					Unobligated balance expiring for obligation on June 30, 1958	Unobligated balance available in fiscal year 1959			Funding analysis of unobligated balance available in fiscal year 1959	
	Planned obligations			Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Total planned apportionment program for fiscal year 1958 (cols. 13+14)		Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Reserved in fiscal year 1958 for carryover into fiscal year 1959	Total unobligated balance available in fiscal year 1959	Appropriations, reimbursements earned and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1958
	For service account (direct obligations and unobligated portions of letters of intent)	For customer orders	Total obligations								
(1)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
DEPARTMENT OF THE ARMY											
General fund accounts:											
Military personnel	3,465,000	175,000	3,640,000		3,640,000	48,000					
Operation and maintenance	3,117,000	354,358	3,471,358		3,471,358	98,000		14,487	14,487		14,487
Procurement and production	1,394,000	150,000	1,544,000	207,891	1,751,891		207,891		207,891		207,891
Military construction, Army Reserve Forces	55,000		55,000	20,000	75,000		20,000	8,076	28,076	28,076	
Reserve personnel	203,200	500	203,700		203,700	3,800					
Army National Guard	326,700	800	327,500		327,500	7,100					
Research and development	447,000	3,000	450,000	25,478	475,478		25,478		25,478	25,478	
Promotion of rifle practice	250		250		250						
Operation and maintenance, Alaska Communication System, Army, 1957–58 and 1958–59	5,500	99	5,599		5,599	35					
Construction, Alaska Communication System	288		288		288			569	569	569	
Subtotal	9,013,938	683,757	9,697,695	253,369	9,951,064	156,935	253,369	23,132	276,501	54,123	222,378
Military construction	350,000		350,000	100,000	450,000		100,000	31,262	131,262	131,262	
Total, general fund accounts	9,363,938	683,757	10,047,695	353,369	10,401,064	156,935	353,369	54,394	407,763	185,385	222,378
Special fund account: Preparation for sale or salvage of military property	23,000		23,000		23,000						
Total, Department of the Army	9,386,938	683,757	10,070,695	353,369	10,424,064	156,935	353,369	54,394	407,763	185,385	222,378

DEPARTMENT OF THE NAVY											
General fund accounts:											
Military personnel, Navy	2,478,000	32,359	2,510,359		2,510,359	7,000					
Reserve personnel, Navy	83,268	200	83,468		83,468	2,732					
Navy personnel, general expenses	84,000	7,430	91,430		91,430	3,000		994	994		994
Military personnel, Marine Corps	609,449	6,582	616,031		616,031	20,551					
Reserve personnel, Marine Corps	22,500	1,823	24,323		24,323	700					
Marine Corps procurement	160,000	6,475	166,475	50,000	216,475		50,000	170,657	220,657	214,657	6,000
Marine Corps troops and facilities	173,000	9,961	182,961		182,961	5,000					
Aircraft and related procurement	[3] 2,100,000	55,753	2,155,753	[3] 1,144,247	3,300,000		1,144,247	322,263	1,466,510	1,394,984	71,526
Aircraft and facilities	840,000	45,641	885,641		885,641	13,500					
Shipbuilding and conversion	1,686,602	16,000	1,702,602	143,000	1,845,602		143,000	706,532	849,532	848,929	603
Ships and facilities	810,000	27,380	837,380		837,380	10,000		3,006	3,006		3,006
Procurement of ordnance and ammunition	310,000	45,420	355,420	25,523	380,943		25,523	6,124	31,647	10,047	21,600
Ordnance and facilities	158,000	7,700	165,700		165,700	5,000					
Medical care	85,200	22,635	107,835		107,835						
Civil engineering	131,000	53,326	184,326		184,326	3,630					
Military construction, Naval Reserve Forces	14,000		14,000	7,000	21,000		7,000	4,725	11,725	11,725	
Research and development	505,000	21,439	526,439	22,725	549,164		22,725		22,725	22,725	
Servicewide supply and finance	294,500	13,363	307,863		307,863	5,500					
Servicewide operations	104,400	5,927	110,327		110,327	2,600					
Naval petroleum reserves	825		825		825						
Subtotal	10,649,744	379,414	11,029,158	1,392,495	12,421,653	79,213	1,392,495	1,214,301	2,606,796	2,503,067	103,729
Military construction	335,000		335,000	100,000	435,000		100,000	12,927	112,927	112,927	
Total, General fund accounts	10,984,744	379,414	11,364,158	1,492,495	12,856,653	79,213	1,492,495	1,227,228	2,719,723	2,615,994	103,729
Special fund accounts:											
Preparation for sale or salvage of military property	12,000		12,000		12,000						
Ships' stores profits	8,100		8,100		8,100			2,303	2,303	2,303	
Total, Department of the Navy	11,004,844	379,414	11,384,258	1,492,495	12,876,753	79,213	1,492,495	1,229,531	2,722,026	2,618,297	103,729
DEPARTMENT OF THE AIR FORCE											
General fund accounts:											
Aircraft and related procurement	[3] 8,000,000	38,000	8,038,000	[3] 2,100,000	10,138,000		2,100,000	342,846	2,442,846	2,051,746	391,100
Procurement other than aircraft	1,320,000	50,000	1,370,000	252,129	1,622,129		252,129		252,129	19,829	232,300
Operation and maintenance	3,960,000	244,550	4,204,550		4,204,550	132,120					
Military personnel	3,792,225	26,253	3,818,478		3,818,478	9,375					
Research and development	647,750	6,436	654,186	25,800	679,986		25,800	64,050	89,850	89,850	
Reserve personnel	55,000		55,000		55,000						
Air National Guard	243,000	126	243,126		243,126	20,000					
Subtotal	18,017,975	365,365	18,383,340	2,377,929	20,761,269	161,495	2,377,929	406,896	2,784,825	2,161,425	623,400
Military construction	1,005,000		1,005,000	270,012	1,275,012		270,012		270,012	270,012	
Total, general fund accounts	19,022,975	365,365	19,388,340	2,647,941	22,036,281	161,495	2,647,941	406,896	3,054,837	2,431,437	623,400

See footnotes at end of table, p. 132.

Department of Defense financial plan for fiscal year 1958—For general and special fund appropriations—Continued

[Thousands of dollars]

Appropriation title	Planned apportionment program					Unobligated balance expiring for obligation on June 30, 1958	Unobligated balance available in fiscal year 1959			Funding analysis of unobligated balance available in fiscal year 1959	
	Planned obligations			Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Total planned apportionment program for fiscal year 1958 (cols. 13+14)		Planned for commitment in fiscal year 1958 (to be unobligated on June 30, 1958)	Reserved in fiscal year 1958 for carryover into fiscal year 1959	Total unobligated balance available in fiscal year 1959	Appropriations, reimbursements earned and anticipated reimbursements from undelivered non-MAP orders [1]	Anticipated earnings from MAP orders undelivered as of June 30, 1958
	For service account (direct obligations and unobligated portions of letters of intent)	For customer orders	Total obligations								
(1)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
DEPARTMENT OF THE AIR FORCE—Con.											
Special fund accounts: Preparation for sale or salvage of military property	9,000		9,000		9,000	1,000					
Total, Department of the Air Force	19,031,975	365,365	19,397,340	2,647,941	22,045,281	162,495	2,647,941	406,896	3,054,837	2,431,437	623,400
DEPARTMENT OF DEFENSE											
General fund accounts:											
All accounts except military construction	38,369,432	1,428,536	39,797,968	4,023,793	43,821,761	414,398	4,023,793	1,644,329	5,668,122	4,718,615	949,507
Military construction accounts	1,700,838		1,700,838	470,012	2,170,850		470,012	44,189	514,201	514,201	
Subtotal	40,070,270	1,428,536	41,498,806	4,493,805	45,992,611	414,398	4,493,805	1,688,518	6,182,323	5,232,816	949,507
Special fund accounts	52,100		52,100		52,100	1,000		2,303	2,303	2,303	
Unidentified source of transfer for United States satellite						−34,200					
Grand total, Department of Defense	40,122,370	1,428,536	41,550,906	4,493,805	46,044,711	381,198	4,493,805	1,690,821	6,184,626	5,235,119	949,507

[1] Amounts in this column include unobligated balances of (1) cash, (2) accounts receivable (unreimbursed deliveries) and (3) anticipated reimbursements from undelivered orders on hand (exclusive of undelivered MAP common item orders which are shown separately).

[2] Does not reflect any fiscal year 1958 MAP common item orders since value and distribution of such orders are not determinable at this time. Available resources and planned obligations shown on this financial plan are subject to upward revision when fiscal year 1958 MAP common item orders are included.

[3] Preliminary, pending completion of analysis of procurement program.

[4] The total obligational availability is the sum of the amounts available to each individual appropriation account. Consequently, the departmental and DOD totals are overstated by the "duplicate count" of reimbursements arising from intraservice and interservice reimbursement transactions.

NOTE.—Amounts will not necessarily add to totals due to rounding.

THE SECRETARY OF DEFENSE,
Washington, June 28, 1957.

Memorandum for:
The Secretary of the Army.
The Secretary of the Navy.
The Secretary of the Air Force.

Pending the completion of the review requested in my memorandum of May 22, 1957, approval of a revised Department of Defense financial plan, based on the Department of Defense Appropriation Act of fiscal year 1958 as finally enacted, and pending the apportionment of funds, essential military functions of the Department of Defense which would be financed from appropriated funds should proceed on an austere basis. Such actions as are taken should be in consonance with the congressional action on the Defense Appropriation Act for fiscal year 1958 and should be consistent with the current expenditure objectives of the Department of Defense.

Pending the apportionment of funds for fiscal year 1958: (1) Obligations may be made in all appropriations for essential operating expenses; (2) for other than essential operating expenses obligating and commitment actions in procurement and construction appropriations shall be within funds apportioned for fiscal year 1957, and obligations shall be limited to those required to record actions resulting from contract awards made on or prior to June 30, 1957; (3) no actions will be taken to increase the scope of programs, undertake new programs or new increments of present programs unless the use of funds for such purposes has been specifically approved by the Secretary of Defense.

Any requests for necessary exceptions to the above may be submitted to this office for consideration.

Further instructions will be issued with respect to actions to be taken in the programs for military assistance.

C. E. WILSON.

THE SECRETARY OF DEFENSE,
Washington, July 25, 1957.

Memorandum for the Secretary of the Navy.

Further reference is made to my memorandum of June 28, relative to rates at which available funds are to be obligated pending enactment of the Department of Defense Appropriation Act for fiscal year 1958, the issuance of Department of Defense financial plan for fiscal year 1958, and the apportionment actions for fiscal year 1958.

In order to provide for essential operating expenses during the first and second quarters of fiscal year 1958, there is attached hereto a schedule of the rates of obligations and commitments for the appropriations:

Navy personnel, general expenses
Marine Corps troops and facilities
Aircraft and facilities
Ships and facilities
Ordnance and facilities
Medical care
Civil engineering
Servicewide supply and finance
Servicewide operations
Preparation for sale/salvage of military property

The amounts for obligations and commitments for each appropriation and subdivision thereof included in this schedule for the first and second quarters of fiscal year 1958 will not be exceeded without specific prior approval of the Secretary of Defense.

Final determination with respect to the financial plan for fiscal year 1958 as a whole must, of course, await congressional action on the Department of Defense Appropriation Act for fiscal year 1958 and will, when made, take into consideration progress towards approved obligation and expenditure objectives as well as program levels approved in connection with development of the fiscal year 1959 budget.

C. E. WILSON.

Obligations and commitment limitations, fiscal year 1958—Department of the Navy

[Millions of dollars]

Appropriation	1st quarter		2d quarter cumulative		Fiscal year 1958 1st and 2d quarters cumulative obligation limitation		
	Total available for obligation and commitment combined	Obligation limitations	Total available for obligation and commitment combined	Obligation limitations	Service account obligations	Reimbursable obligations	Total obligations
Navy personnel, general expenses	27.9	20.6	51.6	43.3	38.8	4.5	43.3
Marine Corps troops and facilities	70.4	43.1	115.3	86.2	80.4	5.8	86.2
Aircraft and facilities:							
Fuel (projects 1A, 2, 7J)	54.3	41.9	89.1	83.8	83.3	0.5	83.8
Aircraft overhaul (activity 3)	56.3	52.3	110.8	107.0	105.1	1.9	107.0
Procurement (projects 1B, 6B, 6C, 7A, 7B, 7C, 7E, 7F, 7G)	34.9	25.3	89.3	72.2	57.8	14.4	72.2
All other	82.9	66.1	147.2	137.8	131.8	6.0	137.8
Total	228.4	185.6	436.4	400.8	378.0	22.8	400.8
Ships and facilities:							
Operation and maintenance of active fleet (activity 1)	86.0	82.8	151.7	148.7	147.8	.9	148.7
Fuel (activity 6)	30.1	30.1	60.6	60.6	60.5	.1	60.6
Shipboard components (activity 7A)	11.1	8.3	22.8	16.7	9.2	7.5	16.7
All other	122.3	77.6	228.0	173.3	169.6	3.7	173.3
Total	249.5	198.8	463.1	399.3	387.1	12.2	399.3
Ordnance and facilities	62.7	38.2	105.8	74.9	71.5	3.4	74.9
Medical care	29.6	25.4	55.3	51.0	39.3	11.7	51.0
Civil engineering:							
Procurement (activity 3)	20.6	2.5	23.9	5.0	5.0	----------	5.0
All other	104.9	36.6	129.8	79.2	50.5	28.7	79.2
Total	125.5	39.1	153.7	84.2	55.5	28.7	84.2
Servicewide supply and finance	105.7	81.2	183.2	155.6	147.7	7.9	155.6
Servicewide operations	38.3	25.3	66.2	48.2	45.7	2.5	48.2
Preparation for sale/salvage of military property	4.0	3.0	7.0	6.0	6.0	----------	6.0

SEPTEMBER 6, 1957.

Memorandum for the Assistant Secretary of the Navy (FM).

Attached hereto is the Bureau of the Budget memorandum returning your initial fiscal year 1958 apportionment schedules for operation and maintenance appropriations. Your attention is invited to the second paragraph of the aforementioned memorandum noting that the basis for approval of the total amounts apportioned is the limitation on obligations of the type established by the Secretary of Defense letter of July 25, 1957. Further, as contained in the returned apportionment schedules, you will note that the Bureau of the Budget has established a 6-month obligation limitation for the appropriations dealt with herein.

Attached also is a schedule of the rates of obligations and commitments for the appropriations listed below:

Navy personnel, general expenses
Marine Corps troops and facilities
Aircraft and facilities, Navy
Ships and facilities, Navy
Ordnance and facilities, Navy
Medical care, Navy
Civil engineering, Navy
Servicewide supply and finance, Navy
Servicewide operation, Navy
Preparation for sale/salvage of military property (forward under separate cover)

This latter schedule is by quarter for the first half of fiscal year 1958, and the amounts indicated for obligation and commitment for each appropriation and subdivision thereof will not be exceeded without specific prior approval from the Office of the Secretary of Defense. However, the amounts indicated in the columns noted as "Service account obligations" and "Reimbursable obligations" are estimates of planned utilization of funds and may be adjusted within the total obligation limitation imposed on each appropriation subdivision.

Apportionment for the last half of fiscal year 1958 will be considered at the time of review of obligations and expenditures objectives and program levels used in the development of the Department of Defense budget for fiscal year 1959.

W. J. MCNEIL.

Obligations and commitment limitations, fiscal year 1958—Department of the Navy

[Millions of dollars]

Appropriation	1st quarter		2d quarter cumulative		Fiscal year 1958 1st and 2d quarters cumulative estimates of service account and reimbursable obligations within the total obligation limitation	
	Total available for obligation and commitment combined	Obligation limitation	Total available for obligation and commitment combined	Obligation limitation	Service account obligations	Reimbursable obligations
Navy personnel, general expenses	24.9	20.2	49.1	43.3	39.6	3.7
Marine Corps troops and facilities	57.5	42.7	104.9	86.2	81.2	5.0
Aircraft and facilities:						
Flight operations (projects 1A, 2)	53.2	46.3	90.1	87.2	86.7	.5
Aircraft overhaul (activity 3)	70.0	54.3	123.0	112.8	110.9	1.9
Supporting equipment, material, and centralized procurement (activities 1B, 7)	82.4	20.5	109.9	66.2	51.8	14.4
All other	70.0	64.5	142.9	134.6	128.6	6.0
Total	275.6	185.6	465.9	400.8	378.0	22.8
Ships and facilities:						
Operation and maintenance of active fleet (activity 1)	86.0	82.8	162.0	148.7	147.8	.9
Fuel (activity 6)	30.1	30.1	60.6	60.6	60.5	.1
All other	133.5	86.7	240.6	190.0	177.3	12.7
Total	249.6	199.6	463.2	399.3	385.6	13.7
Ordnance and facilities	51.3	38.4	94.2	74.9	71.0	3.9
Medical care	29.5	25.2	55.2	51.0	39.7	11.3
Civil engineering	73.3	38.1	116.4	84.2	57.5	26.7
Servicewide supply and finance	89.9	80.6	163.6	155.6	148.9	6.7
Servicewide operations	37.4	25.3	63.6	48.2	45.7	2.5
Preparation for sale/salvage of military property	4.0	3.0	7.0	6.0	6.0	----

NOVEMBER 25, 1957.

Memorandum for Assistant Secretary of Defense (Comptroller).

Subject: Information required by the Defense Subcommittee, House Appropriations Committee.

1. During the hearings on IRBM's by the Defense Subcommittee of the House Appropriations Committee on November 21, Mr. Mahon asked that each service provide a tabulation showing, by appropriation, the amount of funds which each service was unable to utilize because of expenditure limitations and other restrictions imposed since the enactment of the appropriation bill for fiscal year 1958.

2. Attached hereto is a tabulation indicating the required data for the Air Force. It is assumed that the Department of Defense will desire to forward this information to the Appropriations Committee.

LYLE S. GARLOCK,
Assistant Secretary of the Air Force.

Listing of total availability in the Air Force Oct. 28, 1957, financial plan adjusted as of Nov. 20, 1957, with reserves as result of expenditure limitation and other restrictions

	Total availability	Reserves as result of expenditure limitation and other restrictions
Aircraft and related procurement	10,671.0	510.0
Procurement other than aircraft	1,647.3	
Military construction	1,272.0	
Operation and maintenance	4,292.5	132.1
Military personnel	3,827.9	
Research and development	737.2	
Reserve personnel	53.0	4.0
Air National Guard	243.1	20.0
Total	[1] 22,744.0	666.1

[1] Includes $206,800,000 fiscal year 1958 MAP common item orders applicable to the above appropriations. Excludes $15,800,000 applicable to the Air Force and other stock funds.

NOTE.—The above availabilities do not reflect the proposed fiscal year 1958 supplemental.

LIST OF WITNESSES

	Page
Bennett, Rear Adm. R	69
Bogart, Maj. Gen. F. A	69
Clark, Rear Adm. J. E	1, 69
Coffin, Col. R. D	1
Daley, Maj. Gen. J. P	69
Deane, Col. J. R	1, 69
Hagen, Dr. J. P	69
Hayward, Rear Adm. J. T	69
Holaday, William	1
Irvine, Lt. Gen. C. S	69
Jacobson, Lt. Col. R. K	69
McCorkle, Brig. Gen. C. M	1, 69
McElroy, Hon. N. H	1
McNeil, Hon. W. J	1
Nunziato, Col. R. J	1
Parr, Lt. Col. W. R	69
Quarles, Hon. D. E	1
Raborn, Rear Adm. W. F	69
Waggoner, A. G	1, 69

INDEX

A

Page

Acceleration of program 6, 43, 67
Acceleration of United States military program 67
Additional funds, need for 32, 40
Air Force program, fiscal restrictions on 83
Antiaircraft defense 51
Antimissile missiles, development of 63
Appropriations for 1958 42
Atlas missile 71

B

Budget for 1959, size of 8, 31

C

Complacency in missile program 106
Cooperation between armed services 97
Cost of operational missiles 41, 72

E

Engines, solid and liquid propellent compared 96
Expenditures on missile programs 5

F

Fuels for missiles 33
Fund requirements, future 59, 72

I

Intercontinental ballistic missiles:
  Anti-ICBM program 25, 26
  Cutback in production 5
Intermediate range ballistic missiles 5
  Acceleration of program 6
  Operational date for 91, 92
  Overseas deployment of 6
Interservice rivalry 22, 24, 58, 61, 102

J

Jupiter missile 74
  Cost of 40
  Crash program 38
  Deployment of 77
  Engine for 92
  Funding of 76, 80, 82, 88
  Mission of 29
  Production 27, 29, 33, 36, 75
  Status of 28, 74, 77
  Versus Thor missile 34, 57, 68, 98, 99

L

Launching facilities 30, 61

M

Manned aircraft, continued production of 101

N

Page

Nose-cone development 74, 90

O

Obligations 55
Operational date of missiles 43

P

Polaris missile 6, 78, 82, 90, 93, 95, 104
Production of missiles 73
Progress payments 86

Q

Quantities of missiles needed for testing 37

R

Rate of production, adequacy of 54
Reliability of missiles 102

S

Satellite program 7, 107
  Army launching 19, 20, 91, 98
  Beginning of work on 18
  Jupiter C, use to launch satellite 109
  Launching by the United States 15, 113
  Missile program, effect on 20
  Navy, assignment to 9
  Secretary Quarles' speech on 64
  Soviet Union program 9, 12, 13, 110, 114, 117
    Effect on United States military planning 31, 50, 53
    Psychological effect of 15, 16, 53, 110
  Vanguard program 11, 12, 17, 18, 91, 108, 112, 113, 116, 119, 120
Secretary of Defense, authority of Office of 46
Slowing down of program 42
Soviet Union:
  Ballistic missile program 78
  Danger of Soviet attack 47
  Mutual deterrence against attack by 49
  Progress in missile field 5
  Secretary Quarles' speech on progress, by 64
Special projects agency 21, 23, 25
Status of funds for ballistic missiles program 83

T

Thor missile:
  Acceleration of program 94
  Cost of 40
  Engine for 92
  Mission of 29, 34
  Production of 26, 29, 36, 40, 83
  Status of 28, 71
  Testing of 72
  Training and support, need for 105
  Versus Jupiter missile 34, 257, 68, 69, 99
Titan missile 71
Training, scientific 60
Transferability of funds 47

U

Unification of the services 22
Urgency of programs 37

W

Withholding of funds by the Defense Department 39, 81, 84, 87
  Secretary McNeil's letter regarding 89

○